Series Special Reports
Resource Requirements

Agricultural Economic Report No. 5

RESOURCE REQUIREMENTS ON FARMS FOR SPECIFIED OPERATOR INCOMES

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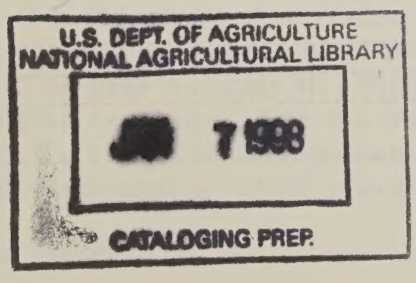

U.S. DEPARTMENT OF AGRICULTURE
Economic Research Service
Farm Production Economics Division
Revised November 1964

PREFACE

This report analyzes the minimum complements of resources needed to enable farm operators to achieve specified levels of earnings for their labor and management. It is one of a group of reports on major types of farming areas widely distributed over the United States.

The first report, Farm Resources Needed for Specified Income Levels, by John M. Brewster, was issued by the Department of Agriculture in 1957 as Agriculture Information Bulletin 180. This first report described major types of farming in six selected areas. A second report, of which the present report is a revision, was issued in 1962. It covered major types of farming in 15 selected areas.

The present report combines the analysis for major types of farming in the 15 areas with an analysis for 14 additional areas. Altogether, 29 farming areas are included.

The following economists of the Farm Production Economics Division, Economic Research Service, had the major responsibility in developing the farm budgets used in the report for their respective States: Warren R. Grant and Troy Mullins, Arkansas; C. V. Moore, California; Elmer C. Hunter, Colorado; E. S. Micka, Connecticut; James L. Esmay, Idaho; V. W. Davis, Illinois; Walter R. Butcher, Iowa; T. W. Miller and C. W. Nauheim, Kansas; James Thompson, Kentucky; A. R. Bird, Massachusetts; Lee M. Day, Minnesota; Grady B. Crowe, Mississippi; LeRoy C. Rude, Montana; Russell D. Lloyd, Nevada; Ronald O. Aines, New Jersey; J. Gwyn Sutherland, North Carolina; William F. Lagrone and W. M. Schultz, Oklahoma; N. D. Kimball, Oregon; Kenneth H. Myers, Pennsylvania; C. P. Butler and W. J. Lanham, South Carolina; S. W. Atkins, Tennessee; Bob Davis, Texas; Clyde E. Stewart, Utah; Earl R. Franklin and Milton H. Steinmueller, Washington; Emil Rauchenstein, Wisconsin.

CONTENTS

	Page
SUMMARY AND CONCLUSIONS	iii
PROBLEM	1
OBJECTIVE AND PROCEDURE	1
FARM SIZE AND RESOURCE REQUIREMENTS	3
Gross Sales	3
Investment Requirements	14
Labor Requirements	14
COMPOSITION OF INPUTS	21
COST OF RESOURCES NEEDED PER DOLLAR OF OPERATOR EARNINGS	24
RELATION OF SIZE OF FARM AND COST PER DOLLAR OF GROSS SALES	25
FAMILY FARM INCOME	25
PROPORTION OF FARMS ON WHICH GROSS SALES IN 1959 WERE LESS THAN ON BUDGETED FARMS	31
EFFECTS OF DIFFERENT PRICES, COSTS, AND YIELDS ON RESOURCE REQUIREMENTS	34
Change in the General Price and Cost Levels	34
Change in Land Values	35
Higher Yields	39
Implications of Varying Yields and Prices	39
APPENDIX	40

Washington, D. C. Revised November 1964

SUMMARY AND CONCLUSIONS

The central purpose of this study was to determine the minimum complement of resources needed to enable farm operators of major types of farms to achieve specified levels of earnings for their labor and management. Major types of farms were budgeted for 4 levels of operator earnings in 29 selected areas. The levels of operator earnings were $2,500, $3,500, $4,500, and $5,500. One or the other of these levels approximated the median earnings of skilled and semiskilled nonfarm workers in each of the States where the study was made. Resources were assumed to be available to the operator in any amount needed at assumed prices. The budgets describe resource requirements for efficiently organized farms on which full use is made of improved practices and available technology. In this way the budgets characterize progressive and adequate-size farms. They do not describe current production and income relationships on average or typical farms.

Major findings of the study are:

(1) The amount of gross sales required on the 29 farms budgeted for operator labor and management earnings of $2,500 a year ranged from $6,750 to $26,450--on 23 of them sales exceeded $10,000. For earnings of $3,500, the range was $9,340 to $36,960. And, for earnings of $4,500 and $5,500, the range was from $11,700 to $49,230 and $14,990 to $62,100, respectively. On 20 of the farms budgeted for $5,550 operator earnings, gross sales exceeded $20,000.

(2) The amount of investment capital in land, buildings, livestock, and equipment exceeded $100,000 on 8 of the farms budgeted for $5,500. At the lowest level of operator earnings ($2,500) such investments exceeded $50,000 on 12 of the 29 budgeted farms.

(3) Investment capital costs on the budgeted farms were calculated at 5 percent per year. At this rate, returns to capital were frequently greater than returns to operator labor and management. This means that families established in farming with a large equity in the farm have considerably more income for family living than families of beginning farmers who have little or no equity and depend largely on labor and management earnings.

(4) Labor used on the budgeted farms varied widely. For the highest level of earnings ($5,500), the amount of operator and hired labor used ranged from 591 to 9,229 man-hours. The average was 3,552 man-hours--about 1-2/5 man-years (assuming a man-year is equivalent to 2,500 man-hours).

Livestock farms generally used more labor than crop farms. However, the degree to which an enterprise is mechanized and the size of farm are important determinants of the amount of labor used on both crop and livestock farms.

(5) Within the range of operator earnings considered in this study, it was found that resources generally were used more efficiently as the level of operator earnings increased. The greatest gain in efficiency was obtained in moving from $2,500 to $3,500 operator earnings. For the most part, only moderate gains were obtained in moving from $4,500 to $5,500 operator earnings. Thus, farmers have two important incentives for increasing output--larger total earnings and lower cost per unit of output.

(6) A decline in prices or an increase in costs generates a drive for farm enlargement, since one of the ways by which farmers can maintain a given level of earnings under a narrowing price-cost spread is to increase the size of their farms.

(7) In only 9 of the 29 areas studied was the majority of farms large enough to produce $2,500 operator earnings. In only 1 area was the majority large enough to provide $5,500 operator earnings. Following is the list of the areas and types of farms which had gross sales in 1959 large enough to provide operator earnings of:

$2,500	$3,500	$4,500	$5,500
Nevada (beef)	Nevada (beef)	Nevada (beef)	Nevada (beef)
New Jersey (dairy)	New Jersey (dairy)	New Jersey (dairy)	
Washington (wheat)	Washington (wheat)	Washington (wheat)	
Arkansas (rice)	Arkansas (rice)		
Idaho (potato)	Idaho (potato)		
South Carolina (dairy)	South Carolina (dairy)		
Iowa (hog)			
Texas (cotton)			
California (cotton)			

(8) These findings suggest that farm enlargement and consolidation will continue. Many factors determine the rate at which this will occur. Two important determinants are the farmers' ability to obtain necessary capital for expanding their businesses, and the limited total demand for farm products at reasonable prices. Because farm enlargement increases income by increasing both the amount and efficiency of resource use, lenders can frequently increase repayment ability by providing their borrowers on small farms with additional capital. Thus, the farmers' ability to obtain appropriate credit is an important means of facilitating farm enlargement.

RESOURCE REQUIREMENTS ON FARMS FOR SPECIFIED OPERATOR INCOMES

By

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PROBLEM

Because their incomes are low, many farmers are making several kinds of adjustments: Some are moving into more remunerative nonfarm employment, others are combining nonfarm employment with farming, and many of those who are staying on farms are reorganizing them into larger units. These adjustments are rapidly changing the structure of our agriculture. Data from the censuses of agriculture show that from 1949 to 1959 the total number of farms decreased by over one-fifth. But the number of farms with over $10,000 in gross sales increased by two-thirds. Despite these rapid changes, however, only about one-third of all commercial farms in 1959 achieved gross marketings of $10,000 or more.

OBJECTIVE AND PROCEDURE

The objective of the study was to determine: (1) The kinds and amounts of resources required on different types of farms in different farming regions to enable farm operators to earn specified incomes; (2) how farms with these complements of resources compare in size, as measured by gross sales, with similar types of farms in the same area; (3) the relative efficiency of resource use at each specified level of operator earnings; (4) how variations in yields and price-cost relationships affect the amounts of resources needed to achieve given levels of operator earnings.

The levels of annual operator earnings selected for use in the study were $2,500, $3,500, $4,500, and $5,500. These levels approximate the median annual earnings of skilled or semiskilled workers in nonfarm employment in different regions of the country. Such nonfarm earnings have increased by over one-third in terms of constant (1959) dollars in the last decade for the Nation as a whole.1/ If present trends continue, farmers will need to push toward higher levels of earnings than those indicated

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1/ Median annual earnings of all male workers employed as operatives and kindred workers were $4,281 for the Nation in 1959 and $3,201 in 1949 (1959 dollars). Such earnings in 1959 ranged from an average of $2,311 in Arkansas and Mississippi to around $5,000 in New Jersey, Michigan, Wisconsin, Ohio, Illinois, Nevada, Washington, Oregon, and California. U.S. averages for 1949 and 1959 are from Trends in the Income of Families and Persons in the United States, 1947 to 1960, U.S. Dept. Commerce, Bur. Census, Tech. Paper No. 8, table 14, p. 276 ff. State averages are from U.S. Census of Population, 1960: U.S. Summary, General Social and Economic Characteristics, U.S. Dept. Commerce, Bur. Census, PC(1)1C, table 140, p. 291.

here to achieve labor and management earnings comparable to those of nonfarm workers.

The first step in the study was to determine, for given types of farming in the specified areas, the complements of resources that would be required to yield each of the specified levels of earnings with the least total value of input cost. For this purpose farm budgets that would produce the specified incomes were developed for 16 types of farms in 29 areas. The locations of the 29 farming areas are shown in figure 1.

In each of these areas the budgeted farms were organized around the minimum amounts and kinds of resources--land, buildings, livestock, machinery, labor, and operating capital--needed to provide each of the specified levels of operator earnings. All resources were assumed to be available for use at specified prices. It was further assumed that the farms would make long-run adjustments to improve income efficiency of operation by combining resources so as to achieve the earning levels at minimum total costs. For example, the dairy farms are budgeted from the standpoint of a person who has access to adequate capital funds for earning, say, $3,500 for his labor and management, provided he combines all resources in ways that will yield the largest net earnings per dollar of input. In developing the budgeted farms in this manner, we assumed farm operators had the managerial ability to run the farms in line with practices specified in the budgets. Other assumptions and procedures used in constructing the budget farms are set forth in the appendix.

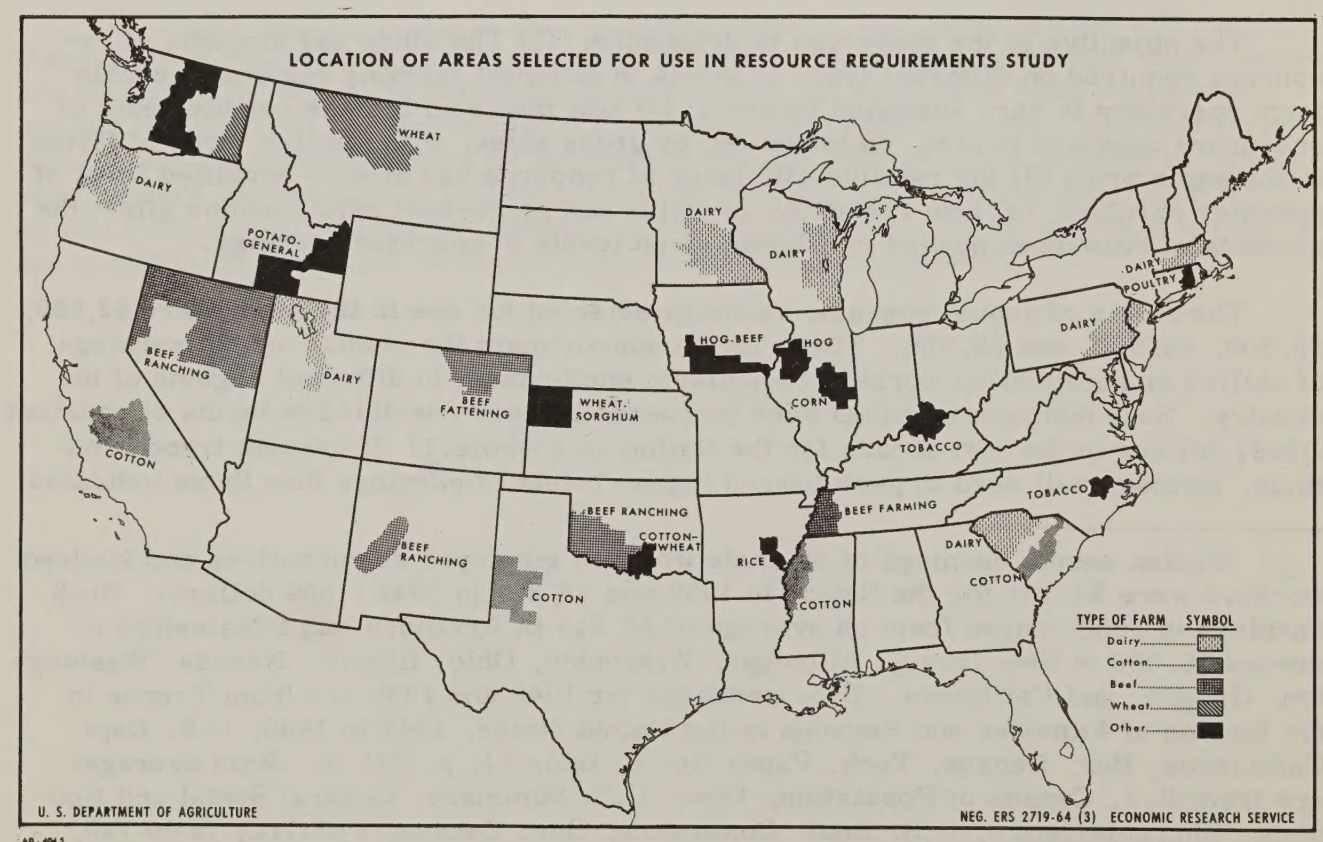

Figure 1

FARM SIZE AND RESOURCE REQUIREMENTS

In this section the budgeted farms are compared with respect to (1) gross sales, (2) total investment, and (3) labor requirements.

The size of farms required for the four levels of operator earnings varies widely, irrespective of what unit is used to measure farm size--gross sales, investment, labor, acreage, number of dairy cows, and the like. To evaluate the magnitude of this variation some common measure of size is needed. An acre of semiarid grazing land is in no way comparable to an acre of fertile Corn Belt land except that they each contain the same number of square feet. Even if all land were equally productive, acres of land would not be a good index of size since land represents only one input; whereas farm output is the function of many inputs--labor, land, and other forms of capital--combined in various proportions. In keeping with this fact, gross sales were used as a measure of farm size, because total costs of all inputs (including the operator's labor and management services) are equivalent to gross sales.

Gross Sales

Owing to differences among areas in resource productivity, farm organization, and price-cost relationships, gross sales required for any given level of operator earnings varies widely among the programed farms which are in different locations. For example, if price-cost relationships permit the operator to receive only 10 cents per dollar of output for his labor and management, he must sell twice as many units to earn $2,500 as he would if he earned 20 cents for each dollar of output. And, if the spread between sales and costs approaches zero, the operator cannot earn much for his labor and management, regardless of the size of his farm.

On the 29 farms for which gross sales were programed, sales required for $2,500 operator earnings range from $6,750 on the Kentucky tobacco farm to $26,450 on the Oklahoma cotton-wheat farm (table 1).2/ For $5,500 operator earnings, gross sales range from $14,990 to $62,100 on these same farms. Twenty-one of the farms budgeted for $2,500 operator earnings, and 23 of those budgeted for $3,500, had gross sales ranging between $10,000 and $20,000 (table 2). On farms budgeted for $4,500 earnings, 24 exceeded $15,000 gross sales. At the highest level of budgeted earnings, 15 farms had sales ranging between $20,000 and $30,000, and 5 exceeded $30,000.

The volume of gross sales associated with a given level of earnings depends more on the location and specific type of farm than on whether it falls in the general category of livestock or crop farms. This is true mainly because differences in location are associated with difference in yields, prices, and costs. Figures 2 and 3 illustrate the relative amounts of sales necessary for specified levels of operator earnings for each type of farm and area selected.

2/ Budgets for specified levels of operator earnings were undertaken for a beef cattle ranch in New Mexico. But under the assumed practices, investment valuation procedures, and price-cost relationships used in this study, it was not possible to budget a ranch of any size that would pay all costs--including a 5-percent return on investment capital--and also enable the operator to earn a return for his labor and management.

Poultry, Beef, Hog, and Dairy Farms

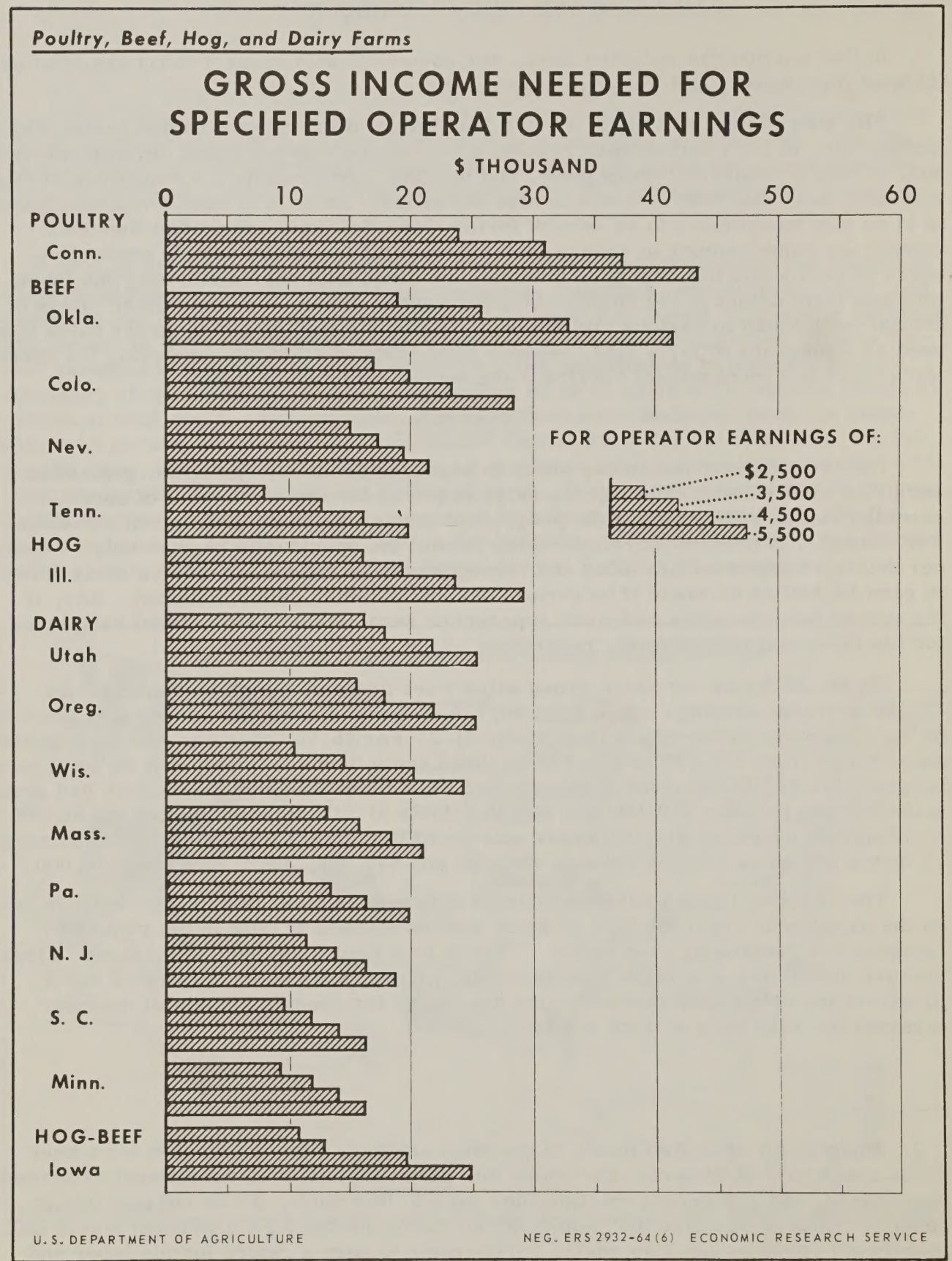

Figure 2

Grain, Cotton, Tobacco, Vegetable, and Fruit Farms

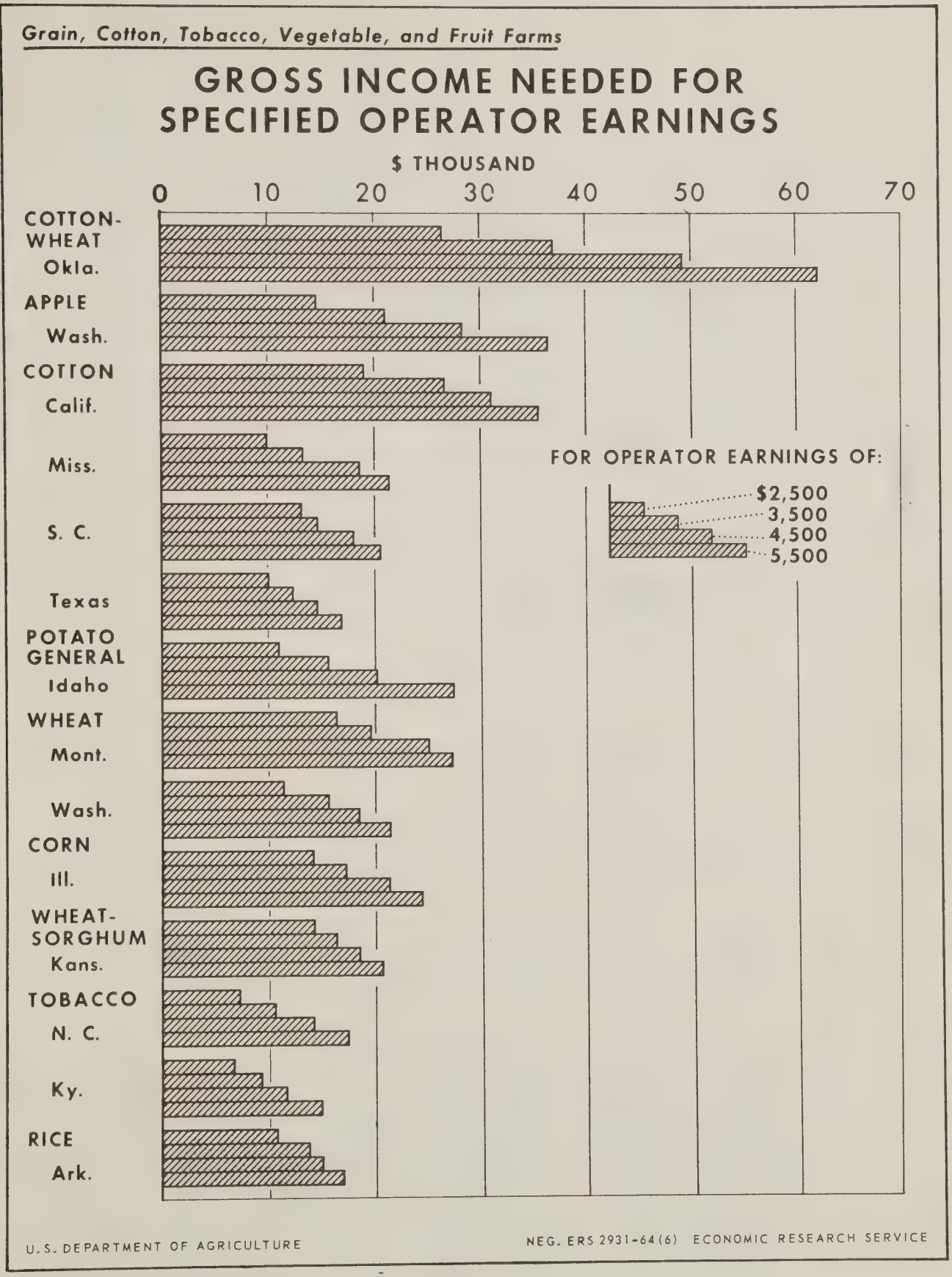

Figure 3

Table 1.--Resources needed for specified levels of operator earnings, 16 types of farms in 29 areas

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $2,500 1/

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
LIVESTOCK								
Dairy:								
Massachusetts	13,104	33,899	67	34	2,273	334	288	20 cows.
Northern New Jersey	11,397	40,414	60	42	1,732	130	183	19 cows.
Southeastern Pennsylvania	11,055	37,325	54	30	2,358	123	106	19 cows.
Eastern Wisconsin	10,420	44,650	120	90	2,500	350	210	25 cows.
Southeastern Minnesota	9,275	42,231	139	102	2,146	---	442	15 cows, 21 feeders.
Central Utah	16,154	56,010	70	66	2,000	1,212	1,922	27 cows, 14 acres beets.
Willamette Valley, Oregon	15,525	50,321	65	54	2,223	72	63	27 cows.
South Carolina Piedmont	9,587	26,183	55	29	1,370	60	269	15 cows.
Beef systems:								
Ranching:								
South central Oklahoma	18,874	162,307	1,908	95	2,500	100	533	212 cows.
Northern Nevada	15,038	86,479	2,583	349	2,083	500	---	175 cows.
Farming, western Tennessee	7,966	25,051	134	42	2,078	477	794	27 cows, 14 acres cotton.
Fattening, northeastern Colorado	16,906	56,392	118	81	1,922	924	709	82 head feeders, 24 acres sugar-beets.
Hog-beef, southern Iowa	10,809	43,137	206	194	1,806	---	---	11 sows, 21 cows. 2/
Hog, west central Illinois	16,064	67,001	162	123	2,133	---	243	18 sows (fattening 272 barrows and gilts), 24 cows (beef).
Poultry, eastern Connecticut	23,850	20,810	10	---	1,337	---	---	2,877 laying hens.
CROP								
Wheat:								
North central Montana	16,424	125,674	1,410	1,270	570	420	933	635 acres wheat.
Palouse area, Washington	11,406	38,200	200	191	---	---	3,786	191 acres wheat.
Wheat sorghum, northwest Kansas	14,313	108,387	1,233	863	1,189	69	---	265 acres wheat, 269 acres grain sorghum.
Cotton-wheat, Rolling Plains area, Oklahoma	26,454	115,864	1,267	989	2,338	730	6,092	314 acres cotton, 422 acres wheat, 90 stockers.
Cotton:								
Upper Coastal Plain, South Carolina	13,144	35,195	230	115	1,256	443	2,681	43 acres cotton, 72 acres soybeans.

--Continued

With over capitalization @ $9,3800 + 2500 or $6300

" Moderate Cap. @ $50 an acre → @ $900 → 10120

If inherited at 800 → 10120

Table 1.--Resources needed for specified levels of operator earnings, 16 types of farms in 29 areas--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $2,500 1/--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
CROP--Con.	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
Cotton:--Con.								
Mississippi Delta	9,924	28,751	128	117	711	655	1,121	26 acres cotton, 91 acres soybeans.
High Plains, Texas	10,046	25,934	145	139	353	---	1,432	140 acres cotton.
San Joaquin Valley, Calif.	19,070	59,325	81	76	2,083	48	4,006	25 acres cotton, 39 acres alfalfa, 9 acres sugarbeets.
Corn, east central Illinois	14,209	82,970	178	160	1,084	---	---	74 acres corn, 43 acres wheat, 43 acres soybeans.
Rice, Grand Prairie, Arkansas	10,813	26,774	154	112	631	---	2,514	39 acres rice, 73 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	7,284	12,051	43	18	1,708	2,133	41	7.2 acres tobacco.
North central Kentucky	6,752	16,044	25	18	2,500	934	168	611 acres tobacco, 14 steers (feeders).
Potato-general, southern Idaho	11,000	29,811	80	62	852	90	2,035	22 acres potatoes, 20 acres wheat, 20 acres alfalfa.
Apple, central Washington	14,580	52,000	25	18	1,628	1,436	1,764	18 acres apples.

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500 1/

LIVESTOCK								
Dairy:								
Massachusetts	15,725	38,390	80	40	2,500	391	384	24 cows.
Northern New Jersey	13,814	46,852	74	51	1,776	250	210	23 cows.
Southeastern Pennsylvania	13,388	42,655	65	36	2,500	253	132	23 cows.
Eastern Wisconsin	14,492	54,250	172	132	2,500	1,310	297	36 cows.
Southeastern Minnesota	11,895	56,783	210	154	1,981	---	577	19 cows, 71 acres corn.
Central Utah	17,839	60,607	78	74	2,500	1,003	2,101	30 cows, 15 acres beets.
Willamette Valley, Oregon	17,825	55,702	70	62	2,500	134	72	31 cows.
South Carolina Piedmont	11,816	29,455	68	35	1,645	75	335	18 cows.
Beef systems:								
Ranching:								
South central Oklahoma	25,730	220,659	2,598	130	2,500	800	---	289 cows.
Northern Nevada	17,293	97,432	2,971	401	2,233	500	---	201 cows.
Farming, western Tennessee	12,660	38,935	215	68	1,794	252	2,289	43 cows, 23 acres cotton.

Table 1.--Resources needed for specified levels of operator earnings, 16 types of farms in 29 areas--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500 1/--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
LIVESTOCK--Con.	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
Beef systems:--Con.								
Fattening, northeastern Colorado	19,838	62,600	139	96	1,922	1,294	834	96 head feeders, 29 acres sugarbeets.
Hog-beef, southern Iowa	12,877	56,460	284	268	2,358	---	---	15 sows, 29 cows. 2/
Hog, west central Illinois	19,303	76,470	186	141	2,500	273	273	22 sows (fattening 327 barrows and gilts), 23 cows (beef).
Poultry, eastern Connecticut	30,905	25,614	10	---	1,733	---	---	3,278 laying hens.
CROP								
Wheat:								
North central Montana	19,647	146,599	1,689	1,520	662	450	1,446	760 acres wheat.
Palouse area, Washington	15,660	63,245	275	261	520	---	2,675	261 acres wheat.
Wheat sorghum, northwest Kansas	16,424	121,422	1,415	990	1,327	79	---	304 acres wheat, 308 acres grain sorghum.
Cotton-wheat, Rolling Plains area, Oklahoma	36,959	161,788	1,773	1,386	2,500	1,398	8,657	441 acres cotton, 591 acres wheat, 126 stockers.
Cotton:								
Upper Coastal Plain, South Carolina	14,667	38,269	227	114	1,333	720	1,301	57 acres cotton, 57 acres soybeans.
Mississippi Delta	13,285	35,797	172	156	952	877	1,502	35 acres cotton, 121 acres soybeans.
High Plains, Texas	12,325	30,529	177	170	433	---	1,756	170 acres cotton.
San Joaquin Valley, California	26,658	77,627	113	106	2,500	443	5,634	35 acres cotton; 55 acres alfalfa; 13 acres sugarbeets.
Corn, east central Illinois	17,266	99,286	217	195	1,317	---	---	90 acres corn; 53 acres wheat; 53 acres soybeans.
Rice, Grand Prairie, Arkansas	13,834	32,386	197	144	680	128	3,217	50 acres rice, 93 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	10,620	17,395	62	26	1,940	3,661	60	10.5 acres tobacco.
North central Kentucky	9,335	22,189	35	25	2,500	1,292	235	8.3 acres tobacco, 19 steers (feeders).

--Continued

Table 1.--Resources needed for specified levels of operator earnings, 16 types of farms in 29 areas--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500 1/--Continued								
CROP--Con.								
Potato-general, southern Idaho	15,626	43,026	100	89	1,080	1,160	232	31 acres potatoes, 29 acres wheat, 29 acres alfalfa.
Apple, central Washington	21,060	71,334	30	26	1,688	2,657	2,548	26 acres apples.
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $4,500 1/								
LIVESTOCK								
Dairy:								
Massachusetts	18,346	42,698	93	47	2,500	685	432	28 cows.
Northern New Jersey	16,287	53,734	89	59	1,935	325	240	27 cows.
Southeastern Pennsylvania	16,298	49,591	80	45	2,500	586	159	28 cows.
Eastern Wisconsin	20,209	72,600	240	180	2,500	2,850	396	50 cows.
Southeastern Minnesota	14,046	65,082	248	182	2,207	---	681	23 cows, 84 acres corn.
Central Utah	21,748	70,598	93	88	2,500	1,500	2,520	37 cows, 18 acres beets
Willamette Valley, Oregon	21,850	65,119	80	76	2,500	731	89	38 cows.
South Carolina Piedmont	14,045	32,726	81	42	1,919	99	401	22 cows.
Beef systems:								
Ranching:								
South central Oklahoma	32,852	280,422	3,314	166	2,500	1,510	---	369 cows.
Northern Nevada	19,367	106,977	3,327	450	2,370	500	---	225 cows.
Farming, western Tennessee	16,090	49,323	275	107	2,075	452	2,173	55 cows, 35 acres cotton.
Fattening, northeastern Colorado	23,324	72,021	162	111	1,872	2,142	976	113 head feeders, 34 acres sugar-beets.
Hog-beef, southern Iowa	19,646	70,712	367	346	2,500	632	---	23 sows, 42 cows. 3/
Hog, west central Illinois	23,627	96,794	246	187	2,500	216	331	27 sows (fattening 400 barrows and gilts), 38 cows (beef).
Poultry, eastern Connecticut	37,225	29,701	10	---	2,087	---	---	4,490 laying hens.
CROP								
Wheat:								
North central Montana	25,140	190,423	2,159	1,943	780	980	971	971 acres wheat.
Palouse area, Washington	18,540	72,845	320	309	615	---	3,168	309 acres wheat.

Table 1.--Resources needed for specified levels of operator earnings, 16 types of farms in 29 areas--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $4,500 1/--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
CROP--Con.								
Wheat sorghum, northwest Kansas	18,585	134,894	1,601	1,121	1,469	90	---	344 acres wheat, 349 acres grain sorghum.
Cotton-wheat, Rolling Plains area, Oklahoma	49,228	225,147	2,500	1,954	2,500	2,869	11,116	469 acres cotton, 1,033 acres wheat, 164 stockers.
Cotton:								
Upper Coastal Plain, South Carolina	18,046	52,677	316	158	1,266	789	1,002	60 acres cotton, 98 acres soybeans.
Mississippi Delta	18,628	60,974	264	240	800	2,322	---	54 acres cotton, 186 acres soybeans.
High Plains, Texas	14,605	35,123	210	202	513	---	2,081	202 acres cotton.
San Joaquin Valley, California	31,093	88,760	132	124	2,500	973	6,528	41 acres cotton, 63 acres alfalfa, 15 acres sugarbeets.
Corn, east central Illinois	21,429	123,122	269	242	1,270	---	---	112 acres corn, 65 acres wheat, 65 acres soybeans.
Rice, Grand Prairie, Arkansas	15,110	39,659	215	157	940	236	1,150	55 acres rice, 102 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	14,263	23,477	84	35	2,195	5,327	81	14 acres tobacco.
North central Kentucky	11,703	27,685	45	32	2,500	1,707	294	10.5 acres tobacco, 25 steers (feeders).
Potato-general, southern Idaho	20,252	56,797	120	116	1,080	1,525	294	40 acres potatoes, 38 acres wheat, 38 acres alfalfa.
Apple, central Washington	28,350	93,875	40	35	1,700	4,058	3,430	35 acres apples.
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $5,500								
LIVESTOCK								
Dairy:								
Massachusetts	20,966	48,543	106	53	2,500	1,022	20	32 cows.
Northern New Jersey	18,681	59,799	102	68	1,955	449	310	31 cows.
Southeastern Pennsylvania	19,797	59,163	97	54	2,500	996	192	34 cows.
Eastern Wisconsin	24,312	86,620	288	216	2,500	3,550	481	60 cows.

Table 1.--Resources needed for specified levels of operator earnings, 16 types of farms in 29 acres--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $5,500 1/--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
LIVESTOCK--Con.	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
Dairy:--Con.								
Southeastern Minnesota	16,196	73,379	286	210	2,431	---	786	26 cows, 95 acres corn.
Central Utah	25,388	80,236	109	104	2,500	2,063	2,950	43 cows, 21 acres beets.
Willamette Valley, Oregon	25,300	73,191	93	88	2,500	1,241	103	44 cows.
South Carolina Piedmont	16,274	35,998	94	49	2,193	104	427	26 cows.
Beef systems:								
Ranching:								
South central Oklahoma	41,399	353,147	4,182	209	2,500	2,500	---	465 cows.
Northern Nevada	21,439	116,523	3,684	498	2,500	500	---	249 cows.
Farming, western Tennessee	19,764	59,777	337	132	2,410	694	2,664	68 cows, 42 acres cotton.
Fattening, northeastern Colorado	28,382	83,954	198	136	1,672	2,673	1,187	138 head feeders, 41 acres sugarbeets.
Hog-beef, southern Iowa	24,912	88,683	465	439	2,500	1,470	---	30 sows, 53 cows. 4/
Hog, westcentral Illinois	29,192	118,882	304	231	2,500	571	409	33 sows (fattening 495 barrows and gilts), 48 cows (beef).
Poultry, eastern Connecticut	43,388	33,661	10	---	2,433	---	---	5,234 laying hens.
CROP								
Wheat:								
North central Montana	27,364	204,823	2,351	2,116	849	980	1,058	1,058 acres wheat.
Palouse area, Washington	21,480	92,435	365	358	856	190	807	358 acres wheat.
Wheat sorghum, northwest Kansas	20,746	148,384	1,787	1,251	1,611	100	---	384 acres wheat, 382 acres grain sorghum.
Cotton-wheat, Rolling Plains area, Oklahoma	62,103	282,408	3,155	2,464	2,500	4,264	14,022	592 acres cotton, 1,303 acres wheat, 207 stockers.
Cotton:								
Upper Coastal Plain, South Carolina	20,614	58,437	361	181	1,394	900	1,145	60 acres cotton, 112 acres soybeans.
Mississippi Delta	21,433	67,627	301	274	900	2,659	---	62 acres cotton, 212 acres soybeans.

--Continued

Table 1.--Resources needed for specified levels of operator earnings, 16 types of farms in 29 areas--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $5,500 1/--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
CROP--Con.	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
Cotton:--Con.								
High Plains, Texas	16,885	39,719	243	233	591	---	2,406	233 acres cotton.
San Joaquin Valley, California	35,554	99,713	151	142	2,500	1,473	7,468	47 acres cotton, 72 acres alfalfa, 17 acres sugarbeets.
Corn, east central Illinois	24,490	139,461	308	277	1,451	---	---	127 acres corn, 75 acres wheat, 75 acres soybeans.
Rice, Grand Prairie, Arkansas	17,056	43,038	243	177	1,061	267	1,298	62 acres rice, 115 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	17,500	28,269	102	43	2,420	6,809	99	17.3 acres tobacco.
North central Kentucky	14,991	36,589	62	44	2,500	2,685	376	13.5 acres tobacco, 32 steers (feeders).
Potato-general, southern Idaho	27,500	73,110	160	150	1,080	2,135	350	55 acres potatoes, 50 acres wheat, 50 acres alfalfa.
Apple, central Washington	36,450	119,015	50	45	1,700	5,702	4,410	45 acres apples.

1/ For budgeting assumptions, see appendix.
2/ Calves fed out on farm.
3/ 15 cows--calves fed out on farm; 27 cows--calves sold as feeders.
4/ 19 cows--calves fed out on farm; 34 cows--calves sold as feeders.

Table 2.--Number of farms with specified annual gross sales, 29 farms programed for 4 levels of operator earnings per year

Operator earnings	Gross sales						Average investment capital per farm
	Under $10,000	$10,000-$14,999	$15,000-$19,999	$20,000-$29,999	$30,000-$39,999	$40,000 and over	
	Farms	Farms	Farms	Farms	Farms	Farms	Dollars
All 29 farms:							
$2,500	6	13	8	2	---	---	13,500
$3,500	1	12	11	3	2	---	17,200
$4,500	---	5	11	9	3	1	21,380
$5,500	---	1	8	15	2	3	25,500
15 livestock farms:							
$2,500	3	5	6	1	---	---	13,730
$3,500	---	7	6	1	1	---	17,030
$4,500	---	2	6	5	2	---	21,000
$5,500	---	---	5	8	---	2	25,030
14 crop farms:							
$2,500	3	8	2	1	---	---	13,240
$3,500	1	5	5	2	1	---	17,380
$4,500	---	3	5	4	1	1	21,780
$5,500	---	1	3	7	2	1	26,010

Operator labor and management earnings per dollar of gross sales on the programed farms are shown in table 3. They average 18 cents at the $2,500 level, and 22 cents at the $5,500 level. This increase in earnings per dollar of sales stems from the more efficient utilization of resources on larger farms.

The effect of different land and product prices and yields per acre on total resources needed for given levels of operator earnings is discussed later in this report. At this point, attention is centered on two requirements: Capital and labor.

Investment Requirements

The role of investment capital varies widely among types of farms. On the Connecticut poultry farms, for example, investment capital plays a minor role, and the annual cost of investment capital represents only 4 percent of the value of all inputs necessary for $4,500 operator earnings. But to obtain the same earnings, the Oklahoma beef cattle ranch required an investment of over $280,000 and its cost represented 45 percent of total costs. Gross sales on this ranch were $32,852 compared with $37,225 on the poultry farm. Similar variations between the amounts of investment capital and other resources required may be found among other types of farms as shown in table 1. The annual cost of investment was calculated at a rate of 5 percent for all farms.

Concerning the amount of investment required for achieving given income levels, the main facts are as follows: (1) Over two-fifths of the farms budgeted for $2,500 operator earnings require investments exceeding $50,000. (2) For $5,500 earnings only 7 farms had less than $50,000 investment. About half of all farms at this level of earnings required over $75,000. Of these, 8 required more than $100,000 investment capital (table 4). These 8 represent several major farming areas--the Oklahoma and Nevada beef cattle ranches, the Illinois hog and corn farms, the Montana wheat farm, the Kansas wheat sorghum farm, the Oklahoma cotton-wheat farm, and the Washington apple orchard (table 1). (3) Average investments for operator earnings of $2,500, $3,500, $4,500, and $5,500 are $53,420, $66,320, $82,190, and $96,710 (table 4). The composition of investment and the relative amounts required in various areas are shown in figures 4 and 5. On farms where enterprises make extensive use of land, such as cattle ranches and cash-grain farms, total investments tend to run extremely high.

Labor Requirements

In preparing the budgets, the maximum amount of operator labor available for farmwork was assumed to be 300 hours for any one month and 2,500 hours annually. No limit was assumed on the amount of hired labor or custom work that might be used.

Total labor (operator and hired) needed for the 29 farms budgeted for $2,500 operator earnings averaged 2,020 man-hours (table 5). For $3,500 operator earnings, average labor used was 2,460 man-hours. These amounts are less than the maximum of 2,500 hours allowed for the operator alone, but even so, 22 of the farms budgeted for $3,500 income hired some labor (figs. 6 and 7). Two reasons acount for hiring labor when the operator is not fully employed: Some tasks required more

Table 3.--Operator earnings per dollar of gross sales, 29 farms programed for 4 levels of operator earnings per year

Type of farm and area	Annual operator earnings			
	$2,500	$3,500	$4,500	$5,500
	Cents	Cents	Cents	Cents
LIVESTOCK				
Dairy:				
Massachusetts	19.1	22.3	24.5	26.2
Northern New Jersey	21.9	25.3	27.6	29.4
Southeastern Pennsylvania	22.6	26.1	27.6	27.8
Eastern Wisconsin	24.0	24.2	22.3	22.6
Southeastern Minnesota	27.0	29.4	32.0	34.0
Central Utah	15.5	19.6	20.7	21.7
Willamette Valley, Oregon	16.1	19.6	20.6	21.7
South Carolina Piedmont	26.1	29.6	32.0	33.8
Beef systems:				
Ranching:				
South central Oklahoma	13.2	13.6	13.7	13.3
Northern Nevada	16.6	20.2	23.2	25.7
Farming, western Tennessee	31.4	27.6	28.0	27.8
Fattening, northeastern Colorado	14.8	17.6	19.3	19.4
Hog-beef, southern Iowa	23.1	27.2	22.9	22.1
Hog, west central Illinois	15.6	18.1	19.0	18.8
Poultry, eastern Connecticut	10.5	11.3	12.1	12.7
Average, 15 livestock farms	18.2	20.6	21.4	22.0
CROP				
Wheat:				
North central Montana	15.2	17.8	17.9	20.1
Palouse area, Washington	21.9	22.3	24.3	25.6
Wheat sorghum, northwest Kansas	11.5	21.3	24.2	26.5
Cotton-wheat, Rolling Plains area, Oklahoma	9.5	9.5	9.1	8.9
Cotton:				
Upper Coastal Plain, South Carolina	19.0	23.9	24.9	26.7
Mississippi Delta	25.2	26.3	24.2	25.7
High Plains, Texas	24.9	28.4	30.8	32.6
San Joaquin Valley, California	13.1	13.1	14.5	15.6
Corn, east central Illinois	17.6	20.3	21.0	22.5
Rice, Grand Prairie, Arkansas	23.1	25.3	29.8	32.2
Tobacco:				
Central Coastal Plain, North Carolina	34.3	33.0	31.6	31.4
North central Kentucky	37.0	37.5	38.5	36.7
Potato-general, southern Idaho	22.7	22.4	22.2	20.0
Apple, central Washington	17.1	16.6	15.9	15.1
Average, 14 crop farms	18.9	20.1	20.7	21.1
Average, all 29 farms	18.5	20.4	21.1	21.6

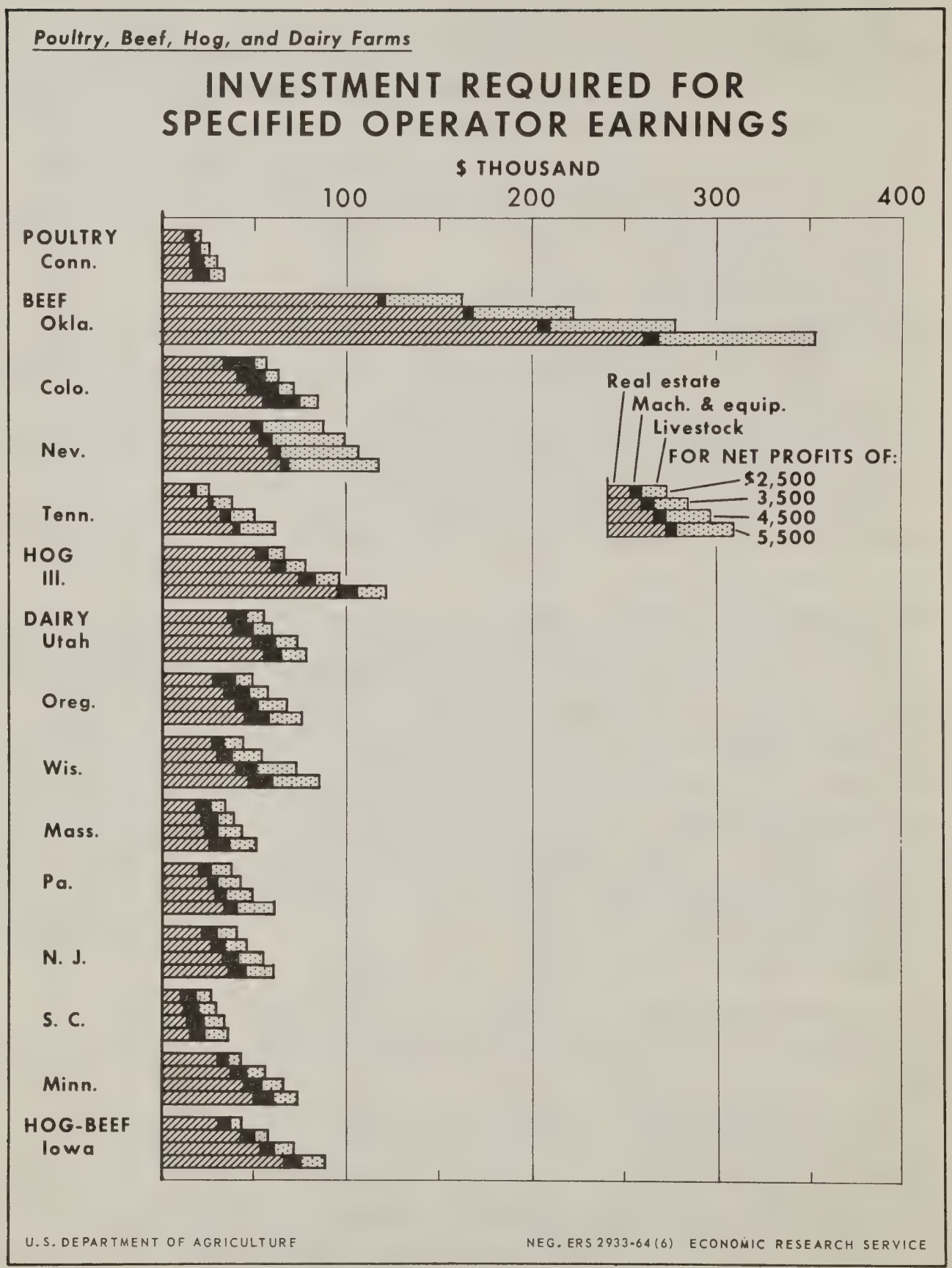
Poultry, Beef, Hog, and Dairy Farms
INVESTMENT REQUIRED FOR SPECIFIED OPERATOR EARNINGS
$ THOUSAND
100
200
300
400
POULTRY
Conn.
BEEF
Okla.
Colo.
Nev.
Tenn.
HOG
Ill.
DAIRY
Utah
Oreg.
Wis.
Mass.
Pa.
N. J.
S. C.
Minn.
HOG-BEEF
Iowa
Real estate
Mach. & equip.
Livestock
FOR NET PROFITS OF:
$2,500
3,500
4,500
5,500
U.S. DEPARTMENT OF AGRICULTURE
NEG. ERS 2933-64 (6) ECONOMIC RESEARCH SERVICE

Figure 4

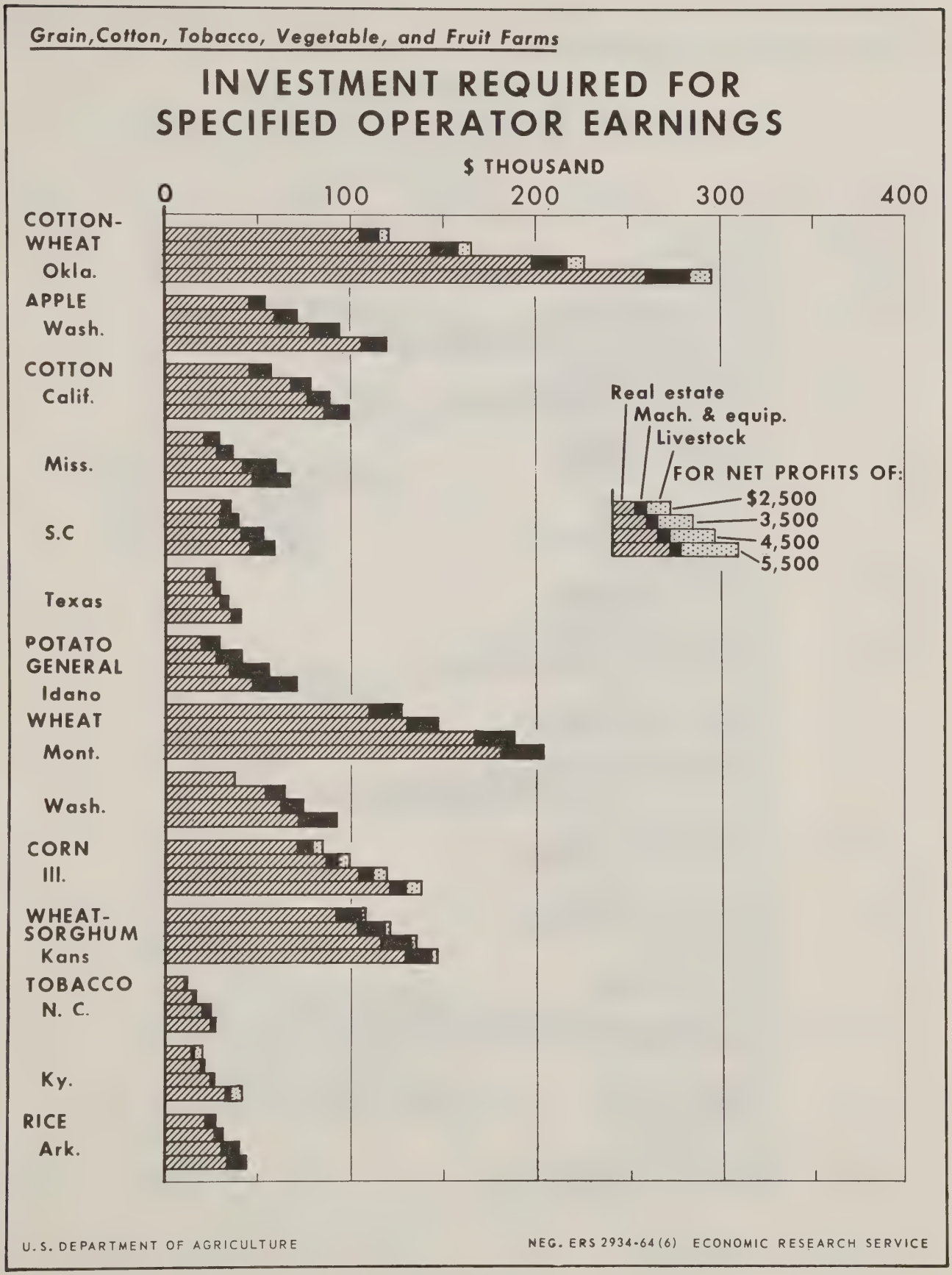
Grain, Cotton, Tobacco, Vegetable, and Fruit Farms
INVESTMENT REQUIRED FOR SPECIFIED OPERATOR EARNINGS
$ THOUSAND
0
100
200
300
400
COTTON-WHEAT
Okla.
APPLE
Wash.
COTTON
Calif.
Miss.
S.C
Texas
POTATO GENERAL
Idano
WHEAT
Mont.
Wash.
CORN
Ill.
WHEAT-SORGHUM
Kans
TOBACCO
N. C.
Ky.
RICE
Ark.
Real estate
Mach. & equip.
Livestock
FOR NET PROFITS OF:
$2,500
3,500
4,500
5,500
U.S. DEPARTMENT OF AGRICULTURE
NEG. ERS 2934-64 (6) ECONOMIC RESEARCH SERVICE

Figure 5

Poultry, Beef, Hog and Dairy Farms

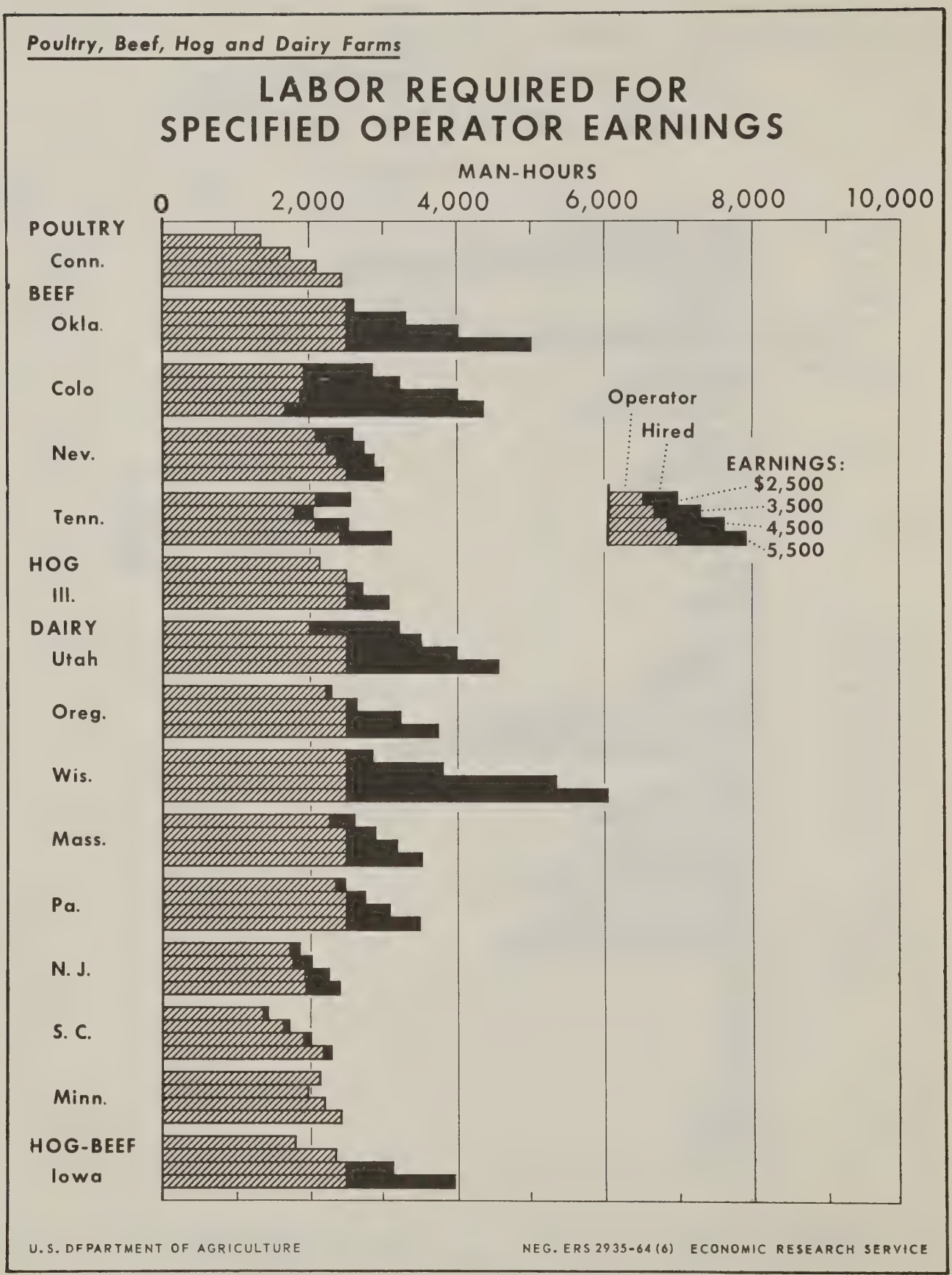

Figure 6

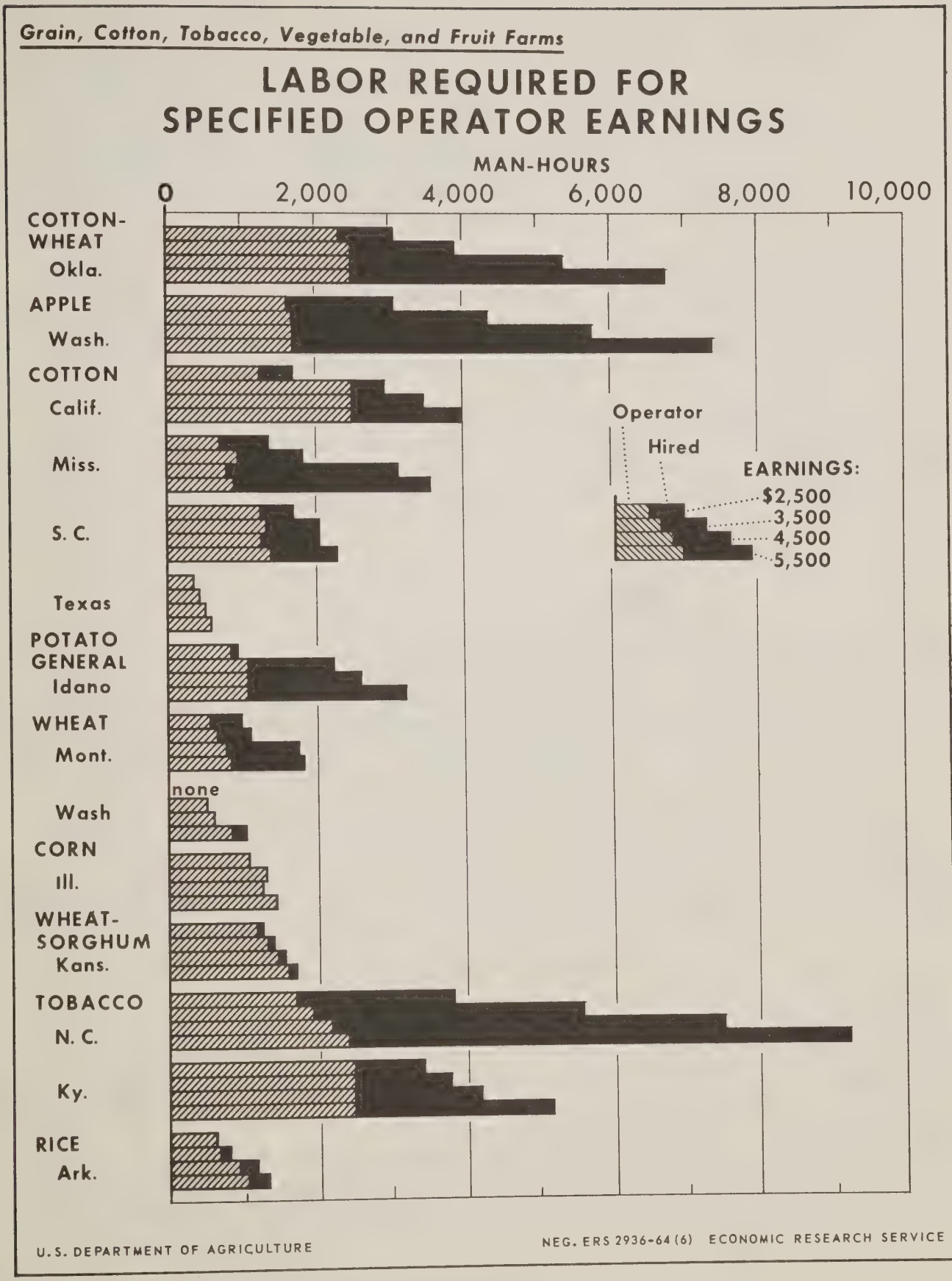
Grain, Cotton, Tobacco, Vegetable, and Fruit Farms
LABOR REQUIRED FOR SPECIFIED OPERATOR EARNINGS
MAN-HOURS
0
2,000
4,000
6,000
8,000
10,000
COTTON-WHEAT
Okla.
APPLE
Wash.
COTTON
Calif.
Miss.
S. C.
Texas
POTATO GENERAL
Idano
WHEAT
Mont.
Wash
none
CORN
Ill.
WHEAT-SORGHUM
Kans.
TOBACCO
N. C.
Ky.
RICE
Ark.
Operator
Hired
EARNINGS:
$2,500
3,500
4,500
5,500
U.S. DEPARTMENT OF AGRICULTURE
NEG. ERS 2936-64 (6) ECONOMIC RESEARCH SERVICE

Figure 7

Table 4.--Number of farms with specified amounts of investment capital, 29 farms programed for 4 levels of operator earnings per year

Operator earnings	Amount of investment capital					Average investment capital per farm
	Below $25,000	$25,000-$49,999	$50,000-$74,999	$75,000-$99,999	$100,000 and over	
	Farms	Farms	Farms	Farms	Farms	Dollars
All 29 farms:						
$2,500	3	14	6	2	4	53,420
$3,500	3	10	8	4	4	66,320
$4,500	1	8	11	3	6	82,190
$5,500	---	7	7	7	8	96,710
15 livestock farms:						
$2,500	1	8	4	1	1	52,810
$3,500	1	5	6	2	1	64,190
$4,500	---	5	7	1	2	77,210
$5,500	---	3	5	4	3	91,440
14 crop farms:						
$2,500	2	6	2	1	3	54,070
$3,500	2	5	2	2	3	68,610
$4,500	1	3	4	2	4	87,530
$5,500	---	4	2	3	5	102,360

Table 5.--Number of farms using specified amounts of labor per year, 29 farms programed for 4 levels of operator earnings per year

Operator earnings	Hours of total labor used 1/					Average labor per farm
	Under 2,500	2,500-3,749	3,750 4,999	5,000-7,499	7,500 and over	
	Farms	Farms	Farms	Farms	Farms	Hours
All 29 farms:						
$2,500	18	10	1	---	---	2,020
$3,500	15	8	5	1	---	2,460
$4,500	11	11	3	3	1	3,010
$5,500	12	6	5	4	2	3,550
15 livestock farms:						
$2,500	8	7	---	---	---	2,310
$3,500	6	7	2	---	---	2,610
$4,500	4	8	2	1	---	3,090
$5,500	5	4	4	1	1	3,560
14 crop farms:						
$2,500	10	3	1	---	---	1,700
$3,500	9	1	3	1	---	2,310
$4,500	7	3	1	2	1	2,930
$5,500	7	2	1	3	1	3,540

1/ Includes operator and hired labor. Family labor, if any, was considered the same as hired labor. Custom work was not included.

than one man for efficient performance, and some highly seasonal tasks have to be performed within a few days and thus may require a large crew. Picking apples is a good example of highly seasonal work. They have to be picked in a relatively short period for highest quality.

Widely varying amounts of labor are required on the budgeted farms. For example, the range on farms budgeted for $5,500 operator earnings was from 591 to 9,229 man-hours--from less than one-quarter to over 3-2/3 man-years.3/ In general, livestock farms require more labor than crop farms (figs. 6 and 7).

On crop and livestock farms alike, the degree of mechanization is one of the most influential factors in determining the amount of labor used. For example, each of the various operations--land preparation, planting, harvesting, and so fourth--to be performed in growing wheat or other cash-grain crops is mechanized. On the other hand, many operations on a tobacco farm are still performed by hand labor.

Factors other than mechanization influence the total labor required for a given level of earnings. Custom hire substitutes for operator and other hired labor. The price-cost ratio influences the labor requirements. Thus two farms of the same type but in different areas may require different amounts of labor because one requires more units of total inputs and output than the other.

Custom hiring is less expensive than owning the equipment where the size of the job to be done is not large enough to spread the overhead cost on machinery over several units of output. For this reason custom hire accounted for all labor and machine work on the Palouse wheat farm budgeted with $2,500 earnings. This farm is too small for the operator to own the necessary machinery. Wheat farms in the area require large and expensive machines. Combines equipped with special leveling devices for use on the steep slopes cost approximately $15,000. The "crawler" tractors used in the area cost about $10,000. Small operations cannot efficiently cover the high overhead costs associated with such equipment.

Twelve of the 14 crop farms and 12 of the 15 livestock farms had some expenditure for custom work when budgeted for $2,500 operator earnings. For $5,500 operator earnings, 11 of the livestock farms and 11 crop farms had expenditure for custom hire. Some modern machines are so large that custom hiring is cheaper than owning for use on many of the farms in the size ranges budgeted.

COMPOSITION OF INPUTS

Table 6 shows that the annual interest charge on investment capital represents over one-fifth of the value of total inputs as an average for all farms. Capital charges averaged 21 percent for the $2,500 level of operator earnings and 22 percent for each of the other 3 income levels.

Depreciation tends to be a slightly lower proportion of total costs on higher levels of earnings. Taxes and insurance represent a constant proportion of total inputs--5 percent at each level of income.

3/ Assuming a man-year is equivalent to 2,500 man-hours.

Table 6.--Inputs, annual percentage distribution, 29 farms programed for 4 levels of operator earnings per year

Inputs	Annual operator earnings			
	$2,500	$3,500	$4,500	$5,500
	Percent	Percent	Percent	Percent
All 29 farms:				
Interest charges on investment capital:				
Real estate 1/	15	16	16	17
Machinery and equipment	3	3	3	2
Livestock 2/	3	3	3	3
Total	21	22	22	22
Depreciation 3/	12	11	11	10
Taxes and insurance 4/	5	5	5	5
Operator's labor 5/	13	12	10	10
Hired labor 6/	3	4	6	7
Custom hire	9	8	7	7
All other 7/	37	38	39	39
Total inputs	100	100	100	100
15 livestock farms:				
Interest charges on investment capital:				
Real estate 1/	12	13	13	14
Machinery and equipment	3	2	2	2
Livestock 2/	5	5	5	5
Total	20	20	20	21
Depreciation 3/	13	12	11	11
Taxes and insurance 4/	5	5	5	5
Operator's labor 5/	16	15	13	11
Hired labor 6/	2	3	4	5
Custom hire	3	3	3	3
All other 7/	41	42	44	44
Total inputs	100	100	100	100

--Continued

Table 6.--Inputs, annual percentage distribution, 29 farms programed for 4 levels of operator earnings per year--Continued

Inputs	Annual operator earnings			
	$2,500	$3,500	$4,500	$5,500
	Percent	Percent	Percent	Percent
14 crop farms:				
Interest charges on investment capital:				
Real estate 1/	19	19	20	20
Machinery and equipment	3	3	3	3
Livestock 2/	8/	8/	8/	8/
Total	22	22	23	23
Depreciation 3/	10	10	11	10
Taxes and insurance 4/	5	5	6	6
Operator's labor 5/	11	10	8	7
Hired labor 6/	4	6	8	9
Custom hire	16	14	11	11
All other 7/	32	33	33	34
Total inputs	100	100	100	100

1/ Excludes value of dwelling.

2/ Includes interest charge on average value of crop inventory (mainly feed for livestock), which amounts to a very small proportion of total cost.

3/ Includes machinery and equipment, livestock, buildings, and other improvements. The bulk of this depreciation was on machinery and equipment; very little was on livestock.

4/ Includes both real estate and personal property taxes on assets used in farm production, and fire and wind insurance where applicable.

5/ Operator labor actually used; valued at regular hired-hand wages.

6/ Hired labor includes all labor other than that of the operator. Family labor, if any, was treated as if it were hired labor.

7/ Includes current expense items such as feed, seed, fertilizer, fuels, and repairs, and the farm share of telephone, electricity, and the like.

8/ Less than 0.5 percent.

The value, at hired wage rates, of the operator's labor that is used for farming operations is a smaller proportion of total cost at higher levels of earnings. The reverse is true of hired labor. Together, they are virtually a constant proportion of total inputs--16 percent for the 3 lower levels of earnings, 17 percent for the highest (table 6).

Custom hire is a smaller proportion of total costs for higher levels of earnings.

The change in composition of costs as farm size increases is similar on both livestock and crop farms. However, the composition of costs for a given level of operator earnings is quite different. Real estate represents about a fifth of total inputs on crop farms, whereas it represents 12 to 14 percent of the value of inputs on livestock farms (table 6). Custom hire and hired labor are a smaller proportion of total costs on livestock farms than on crop farms. Operator labor constitutes a larger proportion of total inputs on the livestock farms than on the crop farms.

The composition of inputs for specific types of farms differs widely from one area to another. For example, total investment capital represents only 5 percent of total costs on the Connecticut poultry farm, but it represented 44 percent of total costs on the Montana wheat farm (appendix table 14).

The total value of inputs varies both by type of farm and by area for the same type of farm. For $2,500 earnings, the range in total value of inputs is from $5,932 on the North Carolina tobacco farm to $26,292 on the Oklahoma cotton-wheat farm (appendix table 14). For the same level of earnings ($2,500) on dairy farms, total input values ranged from $8,320 in the South Carolina Piedmont to $16,154 in Utah. Similar variations in total costs are associated with all levels of earnings. Figures 8 and 9 show the differences in the level and composition of inputs associated with the various types of farms and areas for farms budgeted with $2,500 and $5,500 earnings.

COST OF RESOURCES NEEDED PER DOLLAR OF OPERATOR EARNINGS

How do farms compare with respect to cost of resources per dollar of operator earnings? In answering this question, operator's labor and management were not considered to be a cost.4/ They were excluded to arrive at the annual cost of the other resources the operator needed to obtain a dollar return for his labor and management.

4/ The value of the operator's labor and management was considered in the analysis, even though this value was excluded in computing total cost per dollar of operator's earnings. Within limits, the operator may substitute his own labor for other inputs to minimize their use. If he has no reservation price for his labor, he would use it to the fullest extent possible as long as he could save a penny's worth of other resources. It is unrealistic to assume that persons would knowingly organize a farm so that some tasks would return only pennies for their labor. Accordingly, a reservation price for the operator's labor was assumed in working out the budgets used in this study. This price was comparable to hired-hand wages in each of the areas. Use of this reservation price resulted in a reasonable degree of mechanization and labor efficiency on all types of farms.

Comparing the budgeted farms on this basis brought out two significant findings. First, as operator earnings increased from $2,500 to $5,500, about 70 percent of the budgeted farms showed a decrease in the amount of resources needed per dollar of such earnings. The other 30 percent show, generally, a slight increase in the value of resources needed. Ten of the 29 farms required only 70 percent as much inputs per dollar of earnings at the $5,500 level of income as at the $2,500 level of earnings (table 7).

Second, the cost of resources per dollar of operator earnings was found to vary according to type and location of farms. On over 80 percent of all the budgeted farms the resource cost per dollar of earnings was less than $5. But the range in cost was from about $2 on the tobacco farms in North Carolina to about $10 on the cotton-wheat farms in Oklahoma. In view of these wide variations, a farmer with limited capital might need to shift to another type of farming or a different area if he wants to increase his earnings.

RELATION OF SIZE OF FARM AND COST PER DOLLAR OF GROSS SALES

For each location and type of farm, larger sizes of farm (measured in acres and gross sales) were required to achieve the successively higher levels of operator earnings. This variation in farm size influences the efficiency with which resources are used when each farm is organized so as to produce the given level of operator earnings at lowest cost. Operator labor actually used in the farming operations was included as an input and was valued at rate comparable to the cost of hired labor in the respective areas. Thus, for this calculation, total annual cost per dollar of output includes a value for all inputs used except operator management.5/

Comparisons of total cost per dollar of output are shown in table 8. In general, the greatest increase in efficiency of production is achieved in moving from the $2,500 to the $3,500 level of operator earnings. In moving from $4,500 to $5,500 the increase in efficiency is less. These observations indicate that a cost curve for these farms would drop sharply at first, then tend to level off.

FAMILY FARM INCOME

The ability of families to withstand reductions in farm income while financing additional investments is more accurately reflected by family income than by operator earnings. The amount of family income is determined by three factors: (1) The amount of operator labor and management earnings; (2) the family's equity in the total farm investment; and (3) the amount of labor contributed to the farm by members of the operator's family.

Table 9 shows average family incomes on the budgeted farms, assuming that all farm capital assets are owned debt-free and that the family furnishes all the labor required (other than custom-hired operations).

5/ By management we refer to farm planning, decision making, and other functions which cannot be measured in units of time or rate of cost. Therefore, no value could be applied.

Poultry, Beef, Hog, and Dairy Farms

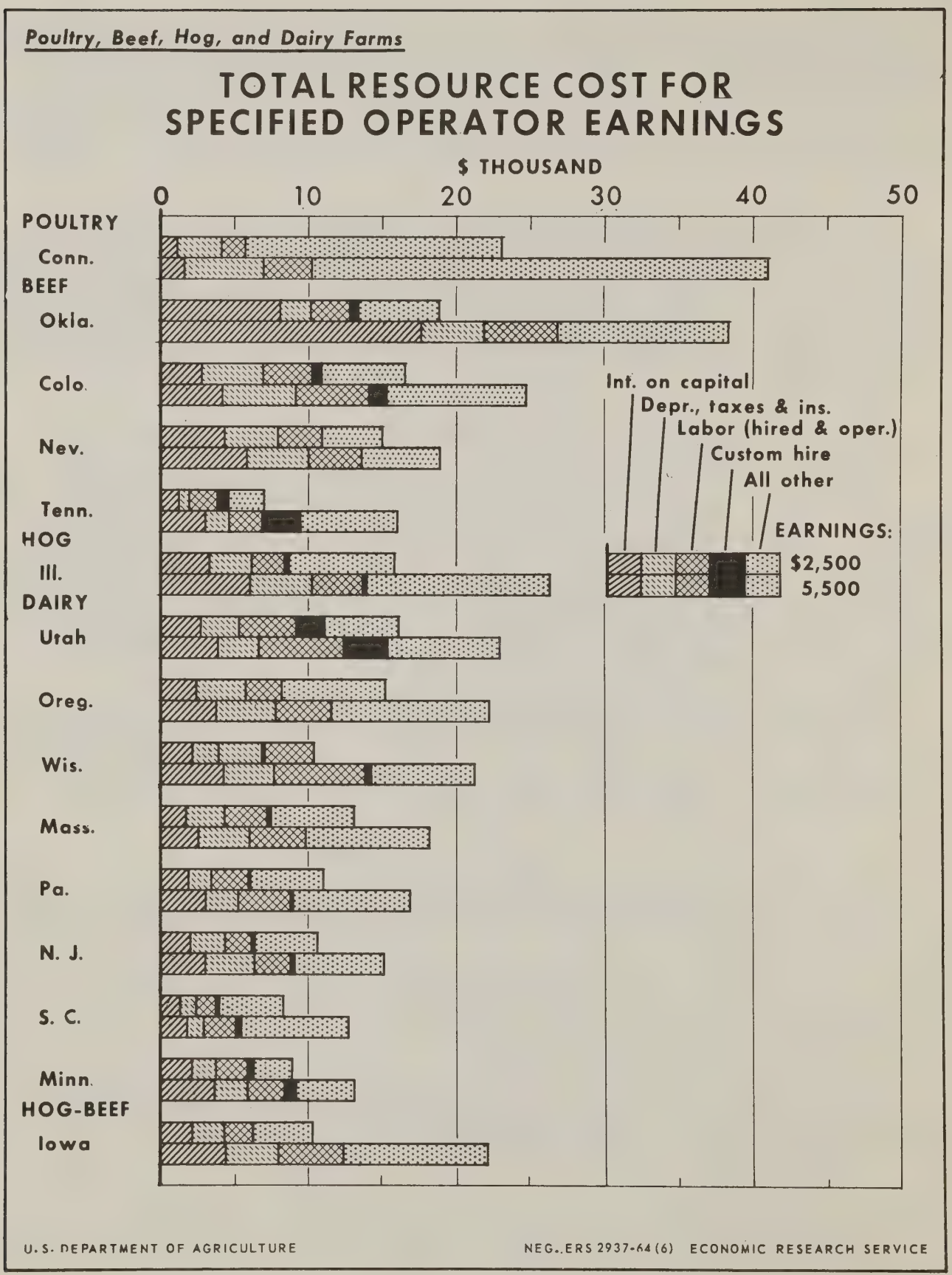

Figure 8

Grain, Cotton, Tobacco, Vegetable, and Fruit Farms

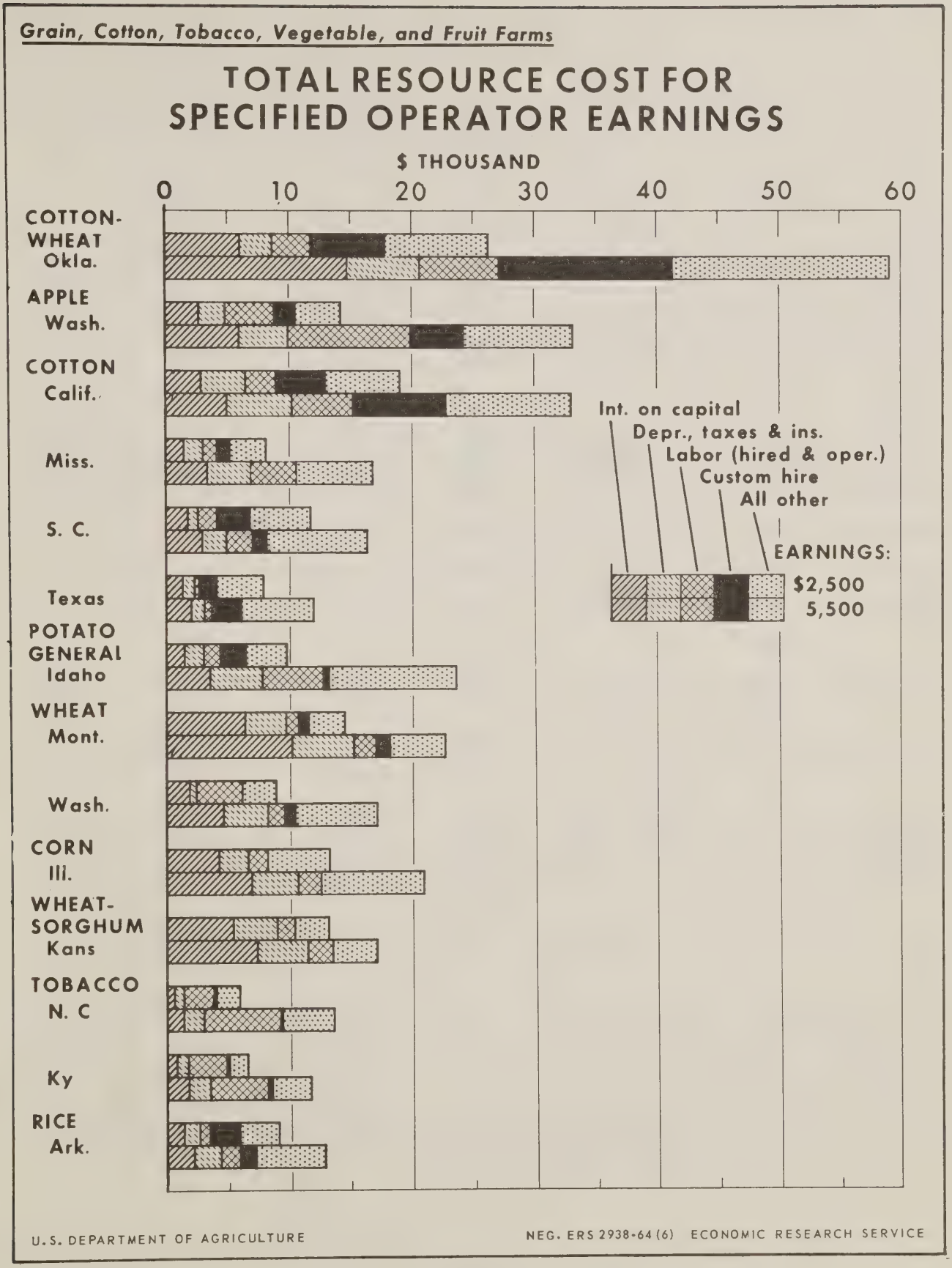

Figure 9

Table 7.--Value of inputs per dollar of operator earnings, 29 farms programed for 4 levels of operator earnings per year 1/

Type of farm and area	Annual operator earnings			
	$2,500	$3,500	$4,500	$5,500
	Dollars	Dollars	Dollars	Dollars
LIVESTOCK				
Dairy:				
Massachusetts	4.24	3.49	3.08	2.81
Northern New Jersey	3.56	2.95	2.62	2.40
Southeastern Pennsylvania	3.42	2.83	2.62	2.60
Eastern Wisconsin	3.17	3.14	3.49	3.42
Southeastern Minnesota	2.71	2.40	2.12	1.94
Central Utah	5.46	4.10	3.83	3.62
Willamette Valley, Oregon	5.21	4.09	3.86	3.60
South Carolina Piedmont	2.83	2.38	2.12	1.96
Beef systems:				
Ranching:				
South central Oklahoma	6.55	6.35	6.30	6.53
Northern Nevada	5.02	3.94	3.30	2.90
Farming, western Tennessee	2.19	2.62	2.58	2.59
Fattening, northeastern Colorado	5.76	4.67	4.18	4.16
Hog-beef, southern Iowa	3.32	2.68	3.37	3.53
Hog, west central Illinois	5.43	4.52	4.25	4.31
Poultry, eastern Connecticut	8.54	7.83	7.27	6.89
CROP				
Wheat:				
North central Montana	5.57	4.61	4.59	3.98
Palouse area, Washington	3.56	3.47	3.12	2.91
Wheat sorghum, northwest Kansas	4.73	3.69	3.13	2.77
Cotton-wheat, Rolling Plains area, Oklahoma	9.58	9.56	9.94	10.29
Cotton:				
Upper Coastal Plain, South Carolina	4.26	3.19	3.01	2.75
Mississippi Delta	2.97	2.80	3.14	2.90
High Plains, Texas	3.02	2.52	2.25	2.07
San Joaquin Valley, California	6.63	6.62	5.91	5.46
Corn, east central Illinois	4.68	3.93	3.76	3.45
Rice, Grand Prairie, Arkansas	3.33	2.95	2.36	2.10
Tobacco:				
Central Coastal Plain, North Carolina	1.91	2.03	2.17	2.18
North central Kentucky	1.70	1.67	1.60	1.73
Potato-general, southern Idaho	3.40	3.46	3.50	4.00
Apple, central Washington	4.83	5.02	5.30	5.63

1/ Does not include the value of the operator's labor as an input.

Table 8.--Value of total inputs per dollar of output, 29 farms programed for 4 levels of operator earnings per year 1/

Type of farm and area	Annual operator earnings			
	$2,500	$3,500	$4,500	$5,500
	Cents	Cents	Cents	Cents
LIVESTOCK				
Dairy:				
Massachusetts	100.0	95.2	90.5	86.9
Northern New Jersey	93.3	87.5	84.3	81.0
Southeastern Pennsylvania	99.8	93.5	88.5	85.5
Eastern Wisconsin	100.0	93.1	90.1	87.7
Southeastern Minnesota	96.2	87.2	83.7	81.1
Central Utah	100.0	97.9	93.7	90.6
Willamette Valley, Oregon	98.2	94.4	90.8	88.1
South Carolina Piedmont	86.8	82.9	80.3	78.3
Beef systems:				
Ranching:				
South central Oklahoma	100.0	96.1	93.9	92.8
Northern Nevada	100.0	95.3	91.4	88.3
Farming, Western Tennessee	88.2	83.0	81.7	81.3
Fattening, northeastern Colorado	98.0	93.3	89.7	87.2
Hog-beef, southern Iowa	95.3	93.0	91.1	89.0
Hog, west central Illinois	98.8	95.9	92.4	90.4
Poultry, eastern Connecticut	100.0	95.9	95.1	94.6
CROP				
Wheat:				
North central Montana	88.2	85.2	85.2	83.0
Palouse area, Washington	78.1	82.1	80.1	79.7
Wheat-sorghum, northwest Kansas	92.1	88.0	84.9	82.4
Cotton-wheat, Rolling Plains area, Oklahoma	99.4	97.3	95.9	95.2
Cotton:				
Upper Coastal Plain, South Carolina	89.5	84.3	81.4	79.4
Mississippi Delta	82.0	80.8	80.1	78.5
High Plains, Texas	78.6	75.1	72.7	70.9
San Joaquin Valley, California	100.0	98.1	95.2	93.0
Corn, east central Illinois	93.2	89.9	87.3	85.6
Rice, Grand Prairie, Arkansas	84.2	80.8	78.0	75.5
Tobacco:				
Central Coastal Plain, North Carolina	81.4	79.2	78.7	77.8
North central Kentucky	97.1	87.2	81.1	78.2
Potato-general, southern Idaho	88.9	88.0	85.8	85.9
Apple, central Washington	97.7	94.0	92.1	91.1

1/ Includes operator's labor, valued at regular hired-hand wages, is included in inputs.

Assuming that the family has 50 percent equity in the farm business and furnishes no labor other than that of the operator, average total family income would be as shown in table 10.

Table 9.--Average family farm income, assuming debt-free ownership of farm capital and no hired labor, 29 farms programed for 4 levels of operator earnings per year

Annual operator earnings	Returns to capital	Returns to family labor	Total family income (includes operator earnings)
	Dollars	Dollars	Dollars
$2,500	2,671	383	5,554
$3,500	3,316	674	7,490
$4,500	4,110	1,107	9,715
$5,500	4,836	1,640	11,976

Table 10.--Average family farm income, assuming 50 percent equity in the farm capital and only operator labor and management earnings, 29 farms programed for 4 levels of operator earnings per year

Annual operator earnings	Returns to capital	Total family income (includes operator earnings)
	Dollars	Dollars
$2,500	1,336	3,836
$3,500	1,658	5,158
$4,500	2,055	6,555
$5,500	2,418	7,918

If all investment capital were borrowed and members of the operator's family contributed no labor to the farm, then family farm income would be limited to the operator's labor and management earnings--$2,500, $3,500, $4,500, or $5,500. As shown in table 9, such earnings may account for considerably less than half of total family income when the families supply a high proportion of the capital and labor.

Table 11 shows family farm income on the 29 farms when budgeted for $4,500 operator earnings, assuming that the family has varying degrees of equity in farm capital and that all labor except that of the operator is hired. Family farm income on these farms varies with differences in total investment requirements. When debt-free ownership of farm capital is assumed, the range is from $5,674 on the North Carolina tobacco farm to about $18,500 on the Oklahoma beef ranch.

PROPORTION OF FARMS ON WHICH GROSS SALES IN 1959 WERE LESS THAN ON BUDGETED FARMS

The organization of American agriculture has been undergoing dramatic change since World War II. From 1944 to 1959 the number of farms with gross sales of $10,000 or more increased from 449,000 to 828,000, an increase of 84 percent. The number of farms with less than $10,000 gross sales declined from 5,049,000 to 3,269,000--a decline of 35 percent. 6/ These trends have accelerated noticeably in recent decades. Yet, even after these marked changes, only about one-third of all commercial farms had more than $10,000 gross sales in 1959.

Despite recent increases in size of farms, a large proportion of all commercial farms of types similar to those analyzed had lower gross sales in 1959 than the levels considered in this study.

In each of the 29 areas in which this study was carried out, comparisons were made between the gross sales of the programed farms and the gross sales of all farms of similar types in the respective State in 1959. The price levels used in programing were approximately the same as the prices prevailing in 1959. Furthermore, the programed farms were organized in a highly efficient manner. Therefore, it appears reasonable to assume that farms having less gross sales than the programed farms were too small to provide operator earnings comparable with those used in this study. While it appears improbable that they could provide higher levels, it is quite possible their earnings were lower, since current use of resources may have been appreciably less efficient than was assumed for the programed farms.

In these terms, it was found that in only 9 of the 29 areas was the majority of farms large enough to produce $2,500 operator earnings (table 12). And in only 6 of the areas was the majority big enough to provide $3,500. In only 3 areas could they provide $4,500 and in only 1 area was the majority large enough to provide $5,500 operator earnings.

6/ Numbers adjusted in line with the 1959 census definition of a farm, and for underenumeration.

Table 11.--Family farm income, assuming specified equities in farm capital and 5 percent interest rate, 29 farms programed for operator earnings of $4,500 per year

Type of farm and area	Family returns for capital assuming--		Total family income assuming--	
	100-percent equity	50-percent equity	100-percent equity	50-percent equity
	Dollars	Dollars	Dollars	Dollars
LIVESTOCK				
Dairy:				
Massachusetts	2,135	1,068	6,635	5,568
Northern New Jersey	2,687	1,344	7,187	5,844
Southeastern Pennsylvania	2,480	1,240	6,980	5,740
Eastern Wisconsin	3,602	1,801	8,102	6,301
Southeastern Minnesota	3,254	1,627	7,754	6,127
Central Utah	3,530	1,765	8,030	6,265
Willamette Valley, Oregon	3,256	1,628	7,756	6,128
South Carolina Piedmont	1,636	818	6,136	5,318
Beef systems:				
Ranching:				
South central Oklahoma	14,021	7,011	18,521	11,511
Northern Nevada	5,349	2,675	9,849	7,175
Farming, western Tennessee	2,466	1,233	6,966	5,733
Fattening, northeastern Colorado	3,601	1,801	8,101	6,301
Hog-beef, southern Iowa	3,535	1,768	8,035	6,268
Hog, west central Illinois	4,839	2,420	9,339	6,920
Poultry, eastern Connecticut	1,485	742	5,985	5,242
CROP				
Wheat:				
North central Montana	9,521	4,761	14,021	9,261
Palouse area, Washington	3,642	1,821	8,142	6,321
Wheat sorghum, northwest Kansas	6,745	3,373	11,245	7,873
Cotton-wheat, Rolling Plains area, Oklahoma	11,257	5,629	15,757	10,129
Cotton:				
Upper Coastal Plain, South Carolina	2,634	1,317	7,134	5,817
Mississippi Delta	3,049	1,525	7,549	6,025
High Plains, Texas	1,756	878	6,256	5,378
San Joaquin Valley, California	4,438	2,219	8,938	6,719
Corn, east central Illinois	6,156	3,078	10,656	7,578
Rice, Grand Prairie, Arkansas	1,983	992	6,483	5,492
Tobacco:				
Central Coastal Plain, North Carolina	1,174	587	5,674	5,087
North central Kentucky	1,385	692	5,885	5,192
Potato-general, southern Idaho	2,840	1,420	7,340	5,920
Apple, central Washington	4,694	2,347	9,194	6,847

Table 12.--Estimated proportion of farms of similar types and in the same States as the programed farms, which in 1959 had lower gross sales than farms programed for 4 levels of operator earnings

Type of farm and State	Gross sales on farms programed for annual operator earnings of--				Proportion of farms which had lower gross sales than farms programed for operator earnings of 1/--			
	$2,500	$3,500	$4,500	$5,500	$2,500	$3,500	$4,500	$5,500
	Dollars	Dollars	Dollars	Dollars	Percent	Percent	Percent	Percent
LIVESTOCK								
Dairy:								
Massachusetts	13,104	15,725	18,346	20,966	52	63	71	77
New Jersey	11,397	13,814	16,287	18,681	29	38	47	55
Pennsylvania	11,055	13,388	16,298	19,797	63	72	82	90
Wisconsin	10,420	14,492	20,209	24,312	75	86	96	98
Minnesota	9,275	11,895	14,046	16,196	73	83	87	91
Utah	16,154	17,839	21,748	25,388	76	81	88	92
Oregon	15,525	17,825	21,850	25,300	72	80	87	90
South Carolina	9,587	11,816	14,045	16,274	36	46	55	61
Beef systems:								
Ranching: 2/								
Oklahoma	18,874	25,730	32,852	41,399	90	92	94	96
Nevada	15,038	17,293	19,367	21,439	33	37	42	46
Tennessee 3/	7,966	12,660	16,090	19,764	83	92	95	97
Colorado 3/	16,906	19,838	23,324	28,382	66	70	73	77
Hog-beef, Iowa 3/	10,809	12,877	19,646	24,912	48	54	74	82
Hog, Illinois 3/	16,064	19,303	23,627	29,192	62	68	74	79
Poultry, Connecticut	23,850	30,905	37,225	43,388	61	69	76	81
CROP								
Wheat: 4/								
Montana	16,424	19,647	25,140	27,364	70	76	82	84
Washington	11,406	15,660	18,540	21,480	28	38	46	53
Wheat sorghum, Kansas 4/	14,313	16,424	18,585	20,746	80	84	88	90
Cotton-wheat, Oklahoma	26,454	36,959	49,228	62,103	95	96	98	99
Cotton:								
South Carolina	13,144	14,667	18,046	20,614	96	97	98	98
Mississippi	9,924	13,285	18,628	21,433	92	94	95	95
Texas	10,046	12,325	14,605	16,885	50	55	60	65
California	19,070	26,658	31,093	35,554	48	57	61	65
Corn, Illinois 4/	14,209	17,266	21,429	24,490	72	82	90	91
Rice, Arkansas 4/	10,813	13,834	15,110	17,056	41	49	52	56
Tobacco:								
North Carolina	7,284	10,620	14,263	17,500	78	93	96	98
Kentucky	6,752	9,335	11,703	14,991	85	93	96	98
Potato-general, Idaho 5/	11,000	15,626	20,252	27,500	30	48	63	73
Apple, Washington 6/	14,580	21,060	28,350	36,450	66	81	86	92

1/ Proportion of farms that have less gross sales than the programed farms were estimated by interpolating within the value intervals in gross sales reported by the census.
2/ The corresponding census type of farm was livestock ranches.
3/ The corresponding census type of farm was livestock other than dairy and poultry.
4/ The corresponding census type of farm was cash-grain.
5/ The corresponding census type of farm was other field crop.
6/ The corresponding census type of farm was fruit and nut.

EFFECTS OF DIFFERENT PRICES, COSTS, AND YIELDS ON RESOURCE REQUIREMENTS

As previously indicated, different yields, prices, and costs may cause considerable variation in operator earnings on a given type of farm. As basic production and price-cost relationships differ from those assumed, the resources required for a given level of earnings also change.

Inability to make accurate projections of yields, prices, costs, and resources needed is a problem constantly faced by farmers as they plan their farm operations. Farm lenders and prospective borrowers also are faced with the uncertainty of projected yields and price-cost relationships when estimating farm income for loan repayments. The following examples illustrate the effects of different yields and price-cost relationships on farm resources needed for given levels of earnings.

Change in the General Price and Cost Levels

The Oklahoma beef cattle ranch budgeted for operator earnings of $3,500 was used to illustrate the effect of different prices received for farm commodities. An increase of 10 percent in the assumed basic prices received for livestock decreases the resources required as follows:

Item	With assumed basic prices	With 10 percent higher prices	Decrease of--
Capital investment---dollars----	220,600	142,600	35 percent
Gross sales----------do------	25,700	16,100	37 percent
Acreage----------acres----	2,600	1,600	38 percent
Cows----------head----	289	181	37 percent

A decrease of 10 percent in the assumed prices received causes a far greater increase in resources required:

Item	With assumed basic prices	With 10 percent lower prices	Increase of--
Capital investment---dollars----	220,600	655,100	197 percent
Gross sales----------do------	25,700	79,200	208 percent
Acreage----------acres----	2,600	8,000	208 percent
Cows----------head----	289	890	208 percent

The magnitude of the increase in resources required illustrates the effect of narrowing the spread between prices and costs. As the difference between prices and costs narrows, more resources are required to realize the same earnings, and this generates pressure to increase farm output. On the beef-cattle ranch the increase in number of cows needed to compensate for the narrower price-cost relationship required an approximately proportional change in all other factors associated with the enterprise--investment, acreage, gross sales, and the like.

An increase in prices paid would also raise the amount of resources required for a given level of operator earnings. The following hypothetical example illustrates the change in total units of output required to obtain a net income of $1,000 when prices received remain the same but when cost per unit of output increases:

Increase in cost per $100 output	Change in net income per $100 output			Change in gross income required to obtain $1,000 net income		
	Amount		Percentage	Amount		Percentage
	From	To		From	To	
	Dollars	Dollars	Percent	Dollars	Dollars	Percent
10 percent (from $80 to $88)	20	12	-40	5,000	8,300	66
20 percent (from $80 to $96)	20	4	-80	5,000	25,000	400

In this example, a 20-percent increase in costs per unit of output decreased net returns 80 percent per unit, and this in turn required a 400-percent increase in gross sales to maintain net income.

Change in Land Values

The effects of changing land values on resource requirements are shown in appendix table 15 for land values decreased 10 percent from assumed basic prices; and in appendix table 16 when such values are increased 10 percent. These two tables may be compared item for item with table 1 one page 6 .

Table 13 shows the percentage change in gross sales, investment capital, and total acres required when different land prices are used. When land values were reduced 10 percent on the 8 types of farms for which comparisons were made, gross sales required for $2,500 operator earnings were reduced slightly. Gross sales required on the Illinois corn farm were 8 percent lower--the largest reduction on any of the farms. Changes were similar for all 4 levels of earnings, as shown in table 13.

Real estate is a major investment on most of the farms programed. Even if total acres remain constant, a 10-percent reduction in land values would have a significant effect on total investment. But acreage requirements actually declined slightly. This pulled total investment down even more. For example, total investment is reduced by 10 percent or more on 5 of the 8 types of farms at the $2,500 level of operator earnings. Total investment on 4 types of farms was reduced 12 percent or more at the $4,500 level of operator earnings.

An increase in land values increases investment more than either gross sales or total acres. Again, the change in gross sales and total acres is fairly closely correlated.

Table 13.--Percentage change in gross sales, investment capital, and total acres required for 4 levels of operator earnings, when land values change, selected types of farms

Type of farm and area	Amount of specified items with land values at basic prices			Percentage change in specified items when land values are change to--					
				10 percent below basic prices			10 percent above basic prices		
	Gross sales	Investment capital	Total land	Gross sales	Investment capital	Total land	Gross sales	Investment capital	Total land
	Dollars	Dollars	Acres	Percent	Percent	Percent	Percent	Percent	Percent
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $2,500									
Beef farming, western Tennessee	7,966	25,051	134	-2	-7	-3	+3	+7	+2
Hog, west central Illinois	16,064	67,001	162	-5	-11	-6	+6	+12	+6
Wheat sorghum, northwest Kansas	14,313	108,387	1,233	-6	-11	-5	+9	+15	+9
Cotton:									
Upper Coastal Plain, South Carolina	13,144	35,195	230	-4	-11	-4	+4	+12	+4
High Plains, Texas	10,046	25,934	145	-2	-9	-3	+2	+10	+2
Corn, east central Illinois	14,209	82,970	178	-8	-15	-8	+11	+16	+6
Rice, Grand Prairie, Arkansas	10,813	26,774	154	-4	-10	-5	+5	+11	+5
Tobacco:									
Central Coastal Plain, North Carolina	7,284	12,051	43	-1	-8	-2	+1	+9	0
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500									
Beef farming, western Tennessee	12,660	38,935	215	-3	-7	-3	+3	+8	+3
Hog, west central Illinois	19,303	76,470	186	-6	-9	-2	+8	+18	+12
Wheat-sorghum, northwest Kansas	16,424	121,422	1,415	-6	-12	-5	+9	+16	+9
Cotton:									
Upper Coastal Plain South Carolina	14,667	38,269	227	-3	-9	-3	+3	+10	+3
High Plains, Texas	12,325	30,529	177	-2	-10	-2	+2	+10	+3
Corn east central Illinois	17,266	99,286	217	-8	-15	-8	+10	+16	+6

--Continued

Table 13.--Percentage change in gross sales, investment capital, and total acres required for 4 levels of operator earnings when land values change, selected types of farms--Continued

Type of farm and area	Amount of specified items with land values at basic prices			Percentage change in specified items when land values are changed to--					
				10 percent below basic prices			10 percent above basic prices		
	Gross sales	Investment capital	Total land	Gross sales	Investment capital	Total land	Gross sales	Investment capital	Total land
	Dollars	Dollars	Acres	Percent	Percent	Percent	Percent	Percent	Percent
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500--Continued									
Rice, Grand Prairie, Arkansas	13,834	32,386	197	-3	-9	-3	+3	+10	+3
Tobacco: Central Coastal Plain, North Carolina	10,620	17,395	62	-2	-8	-2	+2	+10	+3
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $4,500									
Beef farming, western Tennessee	16,090	49,323	275	-2	-7	-3	+3	+7	+3
Hog, west central Illinois	23,627	96,794	246	-8	-14	-9	+12	+20	+12
Wheat sorghum, northwest Kansas	18,585	134,894	1,601	-6	-12	-5	+8	+16	+8
Cotton: Upper Coastal Plain, South Carolina	18,046	52,677	316	-3	-12	-3	+3	+10	+3
Cotton: High Plains, Texas	14,605	35,123	210	-2	-10	-2	+2	+11	+2
Corn, east central Illinois	21,429	123,122	269	-8	-15	-8	+10	+14	+6
Rice, Grand Prairie, Arkansas	15,110	39,659	215	-2	-8	-2	+2	+8	+2
Tobacco: Central Coastal Plains, North Carolina	14,263	23,477	84	-2	-9	-2	+1	+9	+1

--Continued

Table 13.- Percentage change in gross sales, investment capital, and total acres required for 4 levels of operator earnings, when land values change, selected types of farms--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $5,500

Type of farm and area	Amount of specified items with land values at basic prices			Percentage change in specified items when land values are changed to--					
				10 percent below basic prices			10 percent above basic prices		
	Gross sales	Investment capital	Total land	Gross sales	Investment capital	Total land	Gross sales	Investment capital	Total land
	Dollars	Dollars	Acre	Percent	Percent	Percent	Percent	Percent	Percent
Beef farming, western Tennessee	19,764	59,777	337	-3	-7	-3	+3	+7	+3
Hog, west central Illinois	29,192	118,882	304	-8	-14	-8	+10	+17	+10
Wheat sorghum, northwest Kansas	20,746	148,384	1,787	-7	-13	-6	+9	+16	+9
Cotton:									
Upper Coastal Plain, South Carolina	20,614	58,437	361	-3	-10	-3	+3	+10	+3
High Plains, Texas	15,885	39,719	243	-2	-11	-2	+2	+11	+2
Corn, east central Illinois	24,490	139,461	308	-8	-15	-8	+10	+15	+6
Rice, Grand Prairie, Arkansas	17,056	43,038	243	-2	-8	-2	+2	+8	+2
Tobacco:									
Central Coastal Plain, North Carolina	17,500	28,269	102	-2	-9	-1	+2	+10	+2

In most cases neither a 10-percent decrease nor a 10-percent increase in land values has very much effect on gross sales and total acres required. But the amount of investment capital required may vary by several thousand dollars. As an extreme example, investments on the Illinois corn farm for $5,500 operator earnings range from about $119,000 at the lower land values to about $160,000 at the higher land values--a range of $41,000. A decrease of such magnitude would represent a large capital loss to an already established farmer, although it might facilitate entry for a person with little accumulated capital. On the other hand, a rise in land values could make farm enlargement easier for some classes of farmers. For example, a farmer who already owns 200 acres of land heavily mortgaged would have an extended credit base for buying additional land if land values rose. If his 200-acre farm was valued at $300 an acre originally, it would be worth $330 an acre with a 10-percent increase in value. His net worth would have increased $6,000.

Higher Yields

On the average, yields on farms have increased for the past several years. Other things being equal, higher yields decrease the resources required for a given level of earnings.

A new variety of wheat has been tested in the Palouse region which is expected to greatly increase yields. With this prospect in view, the budget for the Palouse wheat farm with $3,500 operator earnings was recalculated under the same cost-price relationships but with 20 percent higher wheat yields per acre--60 bushels rather than 50. The following changes in the farm budget resulted:

Item	Assumed yields	10 percent higher yields	Decrease
Capital investment-------dollars---	63,245	28,400	55 percent
Gross sales----------------do------	15,660	10,220	35 percent
Cropland------------------acres----	261	142	46 percent

Implications of Varying Yields and Prices

The foregoing analyses illustrate the impact of varying yields, prices, and costs on resources required for a given level of income. Within certain limits, farmers can maintain a given level of earnings when product prices decrease, or when costs increase, if they can increase their resources and produce a larger output. But eventually a point is reached where an increase in farm size cannot offset income loss resulting from a price-cost squeeze. On the Oklahoma beef-cattle ranch, for example, it becomes impossible to obtain any net operator earnings when the basic prices used in the budgets are decreased as much as 20 percent.

Many farmers cannot immediately make the change in size of business required to continue a given level of earnings when prices decrease or costs rise. Under such

conditions, they suffer a decline in earnings until they are able to make the necessary changes. A 10-percent drop in prices received on the Oklahoma beef-cattle ranch would decrease earnings 66 percent, from $3,500 to $1,205, with the same resources and size of farm. Thus, a price-cost squeeze might generate a drive among farmers either to increase the size of their farms or to change to another occupation.

For several years farmers have been faced with relatively unfavorable price-cost conditions while earnings in the nonfarm economy have risen. Their attempts to improve their earnings have resulted in an unprecedented rate of change in the number and size of farms and the concurrent adoption of new and improved practices. There is no indication that the rate of change will abate in the future.

APPENDIX

Central Concepts and Procedures for Determining Resources Required for Specified Levels of Operator Earnings

The programing objective was to determine for given types of farms in selected areas the long-run least-cost organization of all measurable production services needed to obtain specified levels of earnings for the operator's labor and management. Both budgeting and linear programing techniques were used in developing these farm plans.

It should be emphasized that the goal just stated differs considerably from the usual type of farm management problem. Instead of maximizing income with some resources at a fixed level, the problem here was to minimize cost for a given income. The problem presupposes a long-run planning situation with all resource quantities being variable.

Operator earnings. --Operator earnings are equal to total farm income minus total farm expenses.

Total farm income is equal to total farm sales, plus the market value of farm products which are used in the household and for which production costs have been calculated and included in total farm expenses.1/

Total annual farm expenses equal the sum of the following:

(1) Interest at 5 percent on total investment in land, buildings, machinery, and livestock, and 6 percent on operating capital. For calculating total investment, buildings and machinery were valued at 55 percent of their replacement cost. The farm dwelling is not included in costs or investment.

(2) Depreciation on livestock, machinery, buildings, and other improvements, calculated by the straight-line method.

1/ It may be customary in some areas to engage in enterprises solely for home consumption. Such enterprises have been excluded from both farm income and farm costs.

(3) Insurance and taxes on real estate and personal property.

(4) Out-of-pocket operating expenses (feed, seed, fuel, hired labor, repairs, and the like).

Practices and yields.--It is generally recognized that current average yields are lower than those that would result from full use of known technology. In the main this condition arises either from the fact that prudent farmers do not have enough capital to use all the best available practices, or from the fact that they have not had sufficient time to make the necessary changes in their farm organizations.

The study assumed no capital restrictions and use of presently known technology and improved practices. Yields which correspond to such techniques and practices were used.

Buildings, equipment, and machinery.--The assumption of a long-run planning situation allowed complete freedom in selecting buildings, machinery, and equipment for the farm plans to conform with the use of the best known technology. This flexibility permitted the realization of the least-cost combination of resources for producing a specified level of operator earnings.

Price and cost rates.--The price and cost rates used in this study were assumed to reflect the following U. S. seasonal average prices for specified farm commodities:

Commodity	Unit	Price
Corn	Bushel	$ 1.10
Oats	do.	.65
Barley	do.	.90
Wheat	do.	1.25
Grain sorghum	Cwt.	1.80
Soybeans	Bushel	2.00
Cottonseed	Ton	50.00
Hay (all)	do.	18.00
Cotton (American upland)	Pound	.25
Dry beans (edible)	Cwt.	6.20
Sugarbeets	Ton	14.35
Peanuts	Pound	.08
Flaxseed	Bushel	3.15
Apples	do.	1.75
Potatoes	cwt.	1.80
Sweetpotatoes	do.	2.80
Tobacco:		
Flue-cured	Pound	.44
Burley	do.	.42
Beef cattle (all)	Cwt.	17.00
Fat steers	do.	23.50
Calves	do.	18.00
Hogs	do.	14.50
Lambs	do.	18.00
Sheep	do.	7.60
Broilers	Pound	.15

--Continued

Commodity	Unit	Price
Eggs	Dozen	$ 0.37
Wool	Pound	.50
Milk:		
Blended	Cwt.	4.00
Fluid	do.	4.65
Manufacturing	do.	3.25

For other commodities, prices were in line with the general level of those listed above. Local area prices were adjusted in line with the above U.S. prices on the basis of location differentials.

Prices paid by farmers are equivalent to 1959 prices paid in the particular locality, with the following exceptions:

(1) Wage rates for hired labor were adjusted in line with an assumed U.S. average index of composite wage rates of 625 (1910-14=100). (The 1959 U.S. average index of composite wage rates for farm labor was 614.)

(2) Purchase prices of unmixed feeds were adjusted to reflect prices received for feed grains and oilseeds.

(3) Prices paid for livestock were adjusted to reflect the prices received for livestock assumed in this study.

Land values.--Land values assumed for a given area were 1959 market values adjusted in line with the relationship between the 1959 price and the assumed price of the major farm commodity produced in that area.

Investment capital charges.--Capital charges were made at the rate of 5 percent on the adjusted 1959 market value for land, the average value during the life of buildings, machinery, and equipment (equivalent to 55 percent of their 1959 new replacement cost), and the inventory value of livestock herds. Investments in livestock herds were based on prices comparable to those received by farmers for similar classes of livestock listed above.

Level of management assumed.--Sufficient managerial capacity was assumed at each level of income to carry out the practices and obtain the yields specified in the budgets. Differences among farmers in managerial ability were disregarded.

Labor assumptions.--All labor other than operator labor was assumed to be hired. No limit was set on the total amount of labor that could be hired on the programed farms.

Further, a "reservation charge" was made for operator labor comparable to the cost of hired labor in the area. The main purpose of this reservation charge was to prevent the inclusion in the farm plans of enterprises or techniques that use labor at very low rates of return. Theoretically, without such a reservation charge operator

labor would be a free resource and, therefore, would be used as long as it could be substituted for other factors at a saving in costs of only a fraction of a cent.

Full ownership tenure was assumed on the programed farms. This assumption was made for two reasons:

(1) Under long-run competitive conditions, rent approaches ownership or "landlord" costs. Thus, since the annual cost of all production factors was charged to the budgeted farms, the total resources required for a specified level of operator earnings would approximate that required under other forms of tenure.

(2) Programing of farms with resources required for given income levels could be accomplished with considerably fewer computations under full ownership than any other form of tenure.

Table 14.--Composition of inputs, 29 farms programed for specified operator earnings

ANNUAL OPERATOR EARNINGS OF $2,500

Type of farm and area	Interest charge on capital investment				Total depreciation 3/	Taxes and insurance 4/	Charge for operator labor 5/	Hired labor	Custom hire	All other 6/	Value of all inputs
	Real estate 1/	Machinery and equipment	Livestock 2/	Total capital charge							
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Dollars
LIVESTOCK											
Dairy:											
Massachusetts	7	3	3	13	15	5	19	3	2	43	13,104
Northern New Jersey	10	4	5	19	15	7	16	1	2	40	10,629
Southeastern Pennsylvania	9	3	5	17	10	4	22	1	1	45	11,031
Eastern Wisconsin	13	3	5	21	12	5	24	4	2	32	10,420
Southeastern Minnesota	17	3	4	24	10	8	24	---	5	29	8,921
Central Utah	11	3	3	17	11	5	15	9	12	31	16,154
Willamette Valley, Oregon	9	4	3	16	16	6	15	1	7/	46	15,248
South Carolina Piedmont	6	5	5	16	10	3	15	1	3	52	8,320
Beef systems:											
Ranching:											
South central Oklahoma	31	1	11	43	6	5	13	1	3	29	18,874
Northern Nevada	16	2	11	29	19	5	16	4	---	27	15,038
Farming, western Tennessee	11	2	5	18	7	3	22	5	11	34	7,025
Fattening, northeastern Colorado	10	5	2	17	19	6	13	7	4	34	16,568
Hog beef, southern Iowa	15	3	3	21	15	6	19	---	---	39	10,296
Hog, west central Illinois	16	2	3	21	12	6	14	---	2	45	15,868
Poultry, eastern Connecticut	3	1	1	5	10	3	7	---	---	75	23,075
CROP											
Wheat:											
North central Montana	38	6	---	44	16	7	4	3	6	20	14,492
Palouse area, Washington	21	---	---	21	---	6	---	---	42	31	8,906
Wheat sorghum, northwest Kansas	35	5	1	41	17	10	10	1	---	21	13,180
Cotton-wheat, Rolling Plains area, Oklahoma	20	2	1	23	5	5	9	3	23	32	26,292
Cotton:											
Upper Coastal Plain, South Carolina	13	2	---	15	6	1	10	3	23	42	11,770

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Table 14.--Composition of inputs, 29 farms programed for specified operator earnings--Continued

ANNUAL OPERATOR EARNINGS OF $2,500--Continued

Type of farm and area	Interest charge on capital investment				Total depreciation 3/	Taxes and insurance 4/	Charge for operator labor 5/	Hired labor	Custom hire	All other 6/	Value of all inputs
	Real estate 1/	Machinery and equipment	Livestock 2/	Total capital charge							
CROP--Con.	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Dollars
Cotton:--Con.											
Mississippi Delta	13	5	---	18	16	3	9	5	13	36	8,135
High Plains, Texas	14	3	---	17	11	1	5	---	18	48	7,899
San Joaquin Valley, California	12	3	---	15	13	6	13	7/	21	32	19,070
Corn, east central Illinois	27	3	2	32	10	8	12	---	---	38	13,236
Rice, Grand Prairie, Arkansas	12	3	---	15	10	4	9	---	27	35	9,100
Tobacco:											
Central Coastal Plain, North Carolina	9	1	---	10	6	7	20	24	1	32	5,932
North central Kentucky	11	1	7/	12	11	3	35	13	3	23	6,559
Potato-general, southern Idaho	10	5	---	15	12	4	13	1	21	34	9,778
Apple, central Washington	16	3	---	19	11	4	15	13	12	26	14,245

ANNUAL OPERATOR EARNINGS OF $3,500

LIVESTOCK											
Dairy:											
Massachusetts	7	3	3	13	14	5	18	3	2	45	14,975
Northern New Jersey	11	3	5	19	15	7	15	2	2	40	12,090
Southeastern Pennsylvania	10	2	5	17	9	4	21	2	1	46	12,513
Eastern Wisconsin	11	3	6	20	11	5	19	10	2	33	13,492
Southeastern Minnesota	18	4	5	27	10	9	19	---	6	29	10,376
Central Utah	11	3	3	17	10	4	18	7	12	32	17,464
Willamette Valley, Oregon	10	4	3	17	15	6	15	1	7/	46	16,825
South Carolina Piedmont	6	4	5	15	9	3	15	1	3	54	9,797
Beef systems:											
Ranching:											
South central Oklahoma	33	1	11	45	7	5	10	3	---	30	24,730
Northern Nevada	16	2	12	30	18	5	16	4	---	27	16,473
Farming, western Tennessee	12	1	5	18	6	3	13	2	22	36	10,506
Fattening, northeastern Colorado	11	4	2	17	17	5	12	8	5	36	18,500

--Continued

Table 14.--Composition of inputs, 29 farms programed for specified operator earnings--Continued

ANNUAL OPERATOR EARNINGS OF $3,500--Continued

Type of farm and area	Interest charge on capital investment				Total depreciation 3/	Taxes and insurance 4/	Charge for operator labor 5/	Hired labor	Custom hire	All other 6/	Value of all inputs
	Real estate 1/	Machinery and equipment	Livestock 2/	Total capital charge							
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Dollars
LIVESTOCK--Con.											
Hog-beef, southern Iowa	18	3	3	24	14	7	21	---	---	34	11,971
Hog, west central Illinois	16	2	3	21	11	5	15	---	1	47	18,503
Poultry, eastern Connecticut	3	1	1	5	10	3	7	---	---	75	29,641
CROP											
Wheat:											
North central Montana	39	5	---	44	14	6	4	3	9	20	16,743
Palouse area, Washington	21	4	---	25	9	6	5	---	21	34	12,852
Wheat sorghum, northwest Kansas	36	5	1	42	16	10	10	1	---	21	14,451
Cotton-wheat, Rolling Plains area, Oklahoma	20	2	1	23	5	5	7	4	24	32	35,959
Cotton:											
Upper Coastal Plain, South Carolina	12	4	---	16	10	2	10	5	10	47	12,370
Mississippi Delta	13	4	---	17	12	3	9	5	14	40	10,737
High Plains, Texas	14	2	---	16	10	1	5	---	19	49	9,258
San Joaquin Valley, California	13	2	---	15	10	7	11	2	22	33	26,158
Corn, east central Illinois	28	2	2	32	9	9	11	---	---	39	15,525
Rice, Grand Prairie, Arkansas	12	2	---	14	8	4	8	1	29	36	11,177
Tobacco:											
Central Coastal Plain, North Carolina	9	1	---	10	5	7	16	30	1	31	8,414
North central Kentucky	12	1	7/	13	12	3	28	15	3	26	8,137
Potato-general, southern Idaho	10	5	7/	15	14	3	12	13	2	41	13,746
Apple, central Washington	15	3	---	18	9	4	11	18	13	27	19,805

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Table 14.--Composition of inputs, 29 farms programed for specified operator earnings--Continued

ANNUAL OPERATOR EARNINGS OF $4,500

Type of farm and area	Interest charge on capital investment				Total depreciation 3/	Taxes and insurance 4/	Charge for operator labor 5/	Hired labor	Custom hire	All other 6/	Value of all inputs
	Real estate 1/	Machinery and equipment	Livestock 2/	Total capital charge							
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Dollars
LIVESTOCK											
Dairy:											
Massachusetts	7	2	4	13	13	5	17	4	3	45	16,596
Northern New Jersey	12	3	5	20	15	7	14	2	2	40	13,722
Southeastern Pennsylvania	10	2	5	17	9	4	18	4	1	47	14,423
Eastern Wisconsin	11	3	6	20	11	5	14	15	2	33	18,209
Southeastern Minnesota	19	4	5	28	9	8	19	---	6	30	11,753
Central Utah	12	3	3	18	8	4	15	7/	12	43	20,373
Willamette Valley, Oregon	10	3	4	17	14	5	12	4	7/	48	19,850
South Carolina Piedmont	6	4	5	15	8	2	15	1	3	56	11,272
Beef systems:											
Ranching:											
South central Oklahoma	33	1	11	45	6	5	8	5	---	31	30,852
Northern Nevada	16	2	12	30	18	5	16	3	---	28	17,711
Farming, western Tennessee	12	2	5	19	7	3	12	2	17	40	13,146
Fattening, northeastern Colorado	11	4	2	17	17	5	10	8	5	38	20,930
Hog-beef, southern Iowa	15	2	3	20	11	6	15	4	---	44	17,896
Hog, west central Illinois	17	2	3	22	11	6	12	1	2	46	21,827
Poultry, eastern Connecticut	2	1	1	4	10	3	---	---	8	75	35,418
CROP											
Wheat:											
North central Montana	39	5	---	44	16	6	4	5	5	20	21,433
Palouse area, Washington	21	4	---	25	8	6	6	---	21	34	14,857
Wheat sorghum, northwest Kansas	37	5	1	43	14	10	11	1	---	21	15,775
Cotton wheat, Rolling Plains area, Oklahoma	21	2	1	24	5	5	5	6	24	31	47,228
Cotton:											
Upper Coastal Plain, South Carolina	14	4	---	18	11	2	8	4	7	50	14,686

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Table 14.--Composition of inputs, 29 farms programed for specified operator earnings--Continued

ANNUAL OPERATOR EARNINGS OF $4,500--Continued

Type of farm and area	Interest charge on capital investment				Total depreciation 3/	Taxes and insurance 4/	Charge for operator labor 5/	Hired labor	Custom hire	All other 6/	Value of all inputs
	Real estate 1/	Machinery and equipment	Livestock 2/	Total capital charge							
CROP--Con.	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Dollars
Cotton:--Con.											
Mississippi Delta	14	6	---	20	21	3	5	18	---	33	14,928
High Plains, Texas	14	2	---	16	9	1	5	---	20	49	10,618
San Joaquin Valley, California	13	2	---	15	10	7	10	4	22	32	29,593
Corn, east central Illinois	28	2	2	32	10	9	10	---	---	39	18,702
Rice, Grand Prairie, Arkansas	13	4	---	17	13	5	10	1	10	44	11,784
Tobacco:											
Central Coastal Plain, North Carolina	9	2	---	11	5	7	13	32	1	31	11,225
North central Kentucky	13	1	7/	14	11	4	24	17	3	27	9,492
Potato-general, southern Idaho	10	6	7/	16	16	4	9	13	2	40	17,372
Apple, central Washington	15	3	---	18	8	4	9	21	13	27	26,111

ANNUAL OPERATOR EARNINGS OF $5,500

LIVESTOCK											
Dairy:											
Massachusetts	7	3	4	14	14	5	15	6	7/	46	18,216
Northern New Jersey	12	3	5	20	15	7	13	3	2	40	15,136
Southeastern Pennsylvania	10	2	6	18	9	4	15	6	1	47	16,922
Eastern Wisconsin	11	3	6	20	11	5	12	17	2	33	21,312
Southeastern Minnesota	19	4	5	28	9	8	19	---	6	30	13,127
Central Utah	12	2	3	17	8	4	14	11	13	33	23,013
Willamette Valley, Oregon	10	3	4	17	13	5	11	6	7/	48	22,300
South Carolina Piedmont	6	3	5	14	7	2	16	1	3	57	12,748
Beef systems:											
Ranching:											
South central Oklahoma	34	1	11	46	6	5	7	6	---	30	38,399
Northern Nevada	17	1	13	31	17	5	16	3	---	28	18,939
Farming, western Tennessee	12	1	6	19	7	3	11	3	16	41	16,072
Fattening, northeastern Colorado	11	4	2	17	15	5	8	12	5	38	24,763

--Continued

Table 14.--Composition of inputs, 29 farms programed for specified operator earnings--Continued

ANNUAL OPERATOR EARNINGS OF $5,500--Continued

Type of farm and area	Interest charge on capital investment				Total depreciation 3/	Taxes and insurance 4/	Charge for operator labor 5/	Hired labor	Custom hire	All other 6/	Value of all inputs
	Real estate 1/	Machinery and equipment	Livestock 2/	Total capital charge							
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Dollars
LIVESTOCK--Con.											
Hog-beef, southern Iowa	15	2	3	20	10	6	12	8	---	44	22,162
Hog, west central Illinois	18	2	3	23	10	6	10	3	1	47	26,392
Poultry, eastern Connecticut	2	1	1	4	10	3	8	---	---	75	41,027
CROP											
Wheat:											
North central Montana	40	5	---	45	16	6	4	4	5	20	---
Palouse area, Washington	21	6	---	27	13	8	7	1	5	39	17,118
Wheat sorghum, northwest Kansas	38	4	1	43	14	10	11	1	---	21	17,099
Cotton-wheat, Rolling Plains area, Oklahoma	22	2	1	25	5	5	4	7	24	30	59,103
Cotton:											
Upper Coastal Plain, South Carolina	14	4	---	18	10	2	8	5	7	50	16,368
Mississippi Delta	14	6	---	20	18	3	5	17	---	37	16,833
High Plains, Texas	15	2	---	17	8	1	5	---	20	49	11,978
San Joaquin Valley, California	13	2	---	15	9	7	9	6	23	31	33,054
Corn, east central Illinois	29	2	2	33	9	9	9	---	---	40	20,953
Rice, Grand Prairie, Arkansas	13	4	---	17	12	5	10	2	10	44	12,883
Tobacco:											
Central Coastal Plain, North Carolina	9	1	---	10	5	7	12	34	1	31	13,608
North central Kentucky	14	1	7/	15	11	4	19	21	3	27	11,726
Potato-general, southern Idaho	10	5	7/	15	15	3	7	14	2	44	23,620
Apple, central Washington	16	2	---	18	8	4	7	23	13	27	33,211

1/ See footnote 1, table 6. 2/ See footnote 2, table 6. 3/ See footnote 3, table 6. 4/ See footnote 4, table 6. 5/ See footnote 5, table 6. 6/ See footnote 6, table 6. 7/ See footnote 8, table 6.

Table 15.--Resources needed for specified levels of operator earnings when land values are decreased 10 percent from assumed basic prices--selected types of farms

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Crop-land	Operator	Hired	Custom	
	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $2,500								
Beef:								
Farming, western Tennessee	7,788	23,324	130	41	2,025	463	775	26 cows, 13 acres cotton.
Hog, west central Illinois	15,249	59,827	153	117	2,205	---	231	18 sows (fattening 258 barrows and gilts), 23 cows (beef).
Wheat sorghum, northwest Kansas	13,450	96,114	1,168	818	1,105	65	---	249 acres wheat, 259 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	12,626	31,213	221	111	1,221	426	2,576	42 acres cotton, 70 acres soybeans.
High Plains, Texas	9,820	23,499	1	136	345	---	1,399	136 acres cotton.
Corn, east central Illinois	13,036	70,487	1	147	1,188	---	---	68 acres corn, 40 acres wheat, 40 acres soybeans.
Rice, Grand Prairie, Arkansas	10,342	24,189	147	107	604	---	2,405	38 acres rice, 70 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	7,184	11,057	42	18	1,701	2,087	41	7.1 acres tobacco, 9 acres wheat.
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500								
Beef:								
Farming, western Tennessee	12,336	36,285	209	66	1,761	249	2,230	42 cows, 22 acres cotton.
Hog, west central Illinois	18,216	69,686	183	139	2,419	---	276	21 sows (fattening 309 barrows and gilts), 27 cows (beef).
Wheat sorghum, northwest Kansas	15,433	107,339	1,341	939	1,231	74	---	285 acres wheat, 297 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	14,295	34,644	221	111	1,308	702	1,268	56 acres cotton, 55 acres soybeans.

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Table 15.--Resources needed for specified levels of operator earnings when land values are decreased 10 percent from assumed basic prices--selected types of farms--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500--Continued								
Cotton:--Con.								
High Plains, Texas	Dollars 12,049	Dollars 27,541	Acres 173	Acres 167	Hours 423	Hours ---	Dollars 1,717	167 acres cotton.
Corn, east central Illinois	15,847	84,150	199	179	1,365	---	---	82 acres corn, 48 acres wheat, 48 acres soybeans.
Rice, Grand Prairie, Arkansas	13,432	29,396	191	139	661	124	3,123	49 acres rice, 91 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	10,421	15,946	61	26	1,927	3,568	59	10.3 acres tobacco.
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $4,500								
Beef:								
Farming, western Tennessee	15,702	46,022	267	104	2,037	428	2,116	54 cows, 34 acres cotton.
Hog, west central Illinois	21,622	83,182	225	171	2,485	---	303	25 sows (fattening 366 barrows and gilts), 36 cows (beef).
Wheat sorghum, northwest Kansas	17,463	118,958	1,517	1,062	1,360	84	---	323 acres wheat, 336 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	17,540	47,618	307	154	1,241	766	974	58 acres cotton, 96 acres soybeans.
High Plains, Texas	14,278	31,585	206	197	501	---	2,035	197 acres cotton.
Corn, east central Illinois	19,666	104,330	247	222	1,375	---	---	102 acres corn, 60 acres wheat, 60 acres soybeans.
Rice, Grand Prairie, Arkansas	14,795	36,592	210	154	921	231	1,126	54 acres rice, 100 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	13,961	21,394	82	35	2,174	5,188	79	13.8 acres tobacco.

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Table 15.--Resources needed for specified levels of operator earnings when land values are decreased 10 percent from assumed basic prices--selected types of farms--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $5,500

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
Beef:								
Farming, western Tennessee	19,229	55,446	327	128	2,373	651	2,591	66 cows, 41 acres cotton.
Hog, west central Illinois	26,749	102,180	279	212	2,500	314	375	31 sows (fattening 453 barrows and gilts), 44 cows (beef).
Wheat sorghum, northwest Kansas	19,259	128,684	1,673	1,171	1,474	93	---	356 acres wheat, 371 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	20,037	52,653	351	176	1,366	875	1,113	66 acres cotton, 109 acres soybeans.
High Plains, Texas	16,506	35,628	238	228	579	---	2,352	228 acres cotton.
Corn, east central Illinois	22,480	118,005	282	254	1,519	---	---	117 acres corn, 69 acres wheat, 69 acres soybeans.
Rice, Grand Prairie, Arkansas	16,700	39,570	237	173	1,039	261	1,271	61 acres rice, 113 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	17,198	25,808	101	43	2,399	6,670	98	17 acres tobacco.

Table 16.--Resources needed for specified levels of operator earnings when land values are increased 10 percent from assumed basic prices--selected types of farms

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $2,500								
Beef:								
Farming, western Tennessee	8,196	26,870	137	43	2,135	488	835	28 cows, 14 acres cotton.
Hog, west central Illinois	16,971	74,980	171	130	2,253	---	257	19 sows (fattening 288 barrows and gilts), 25 cows (beef).
Wheat-sorghum, northwest Kansas	15,539	125,097	1,338	937	1,269	75	---	287 acres wheat, 292 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	13,705	39,534	240	120	1,294	462	2,796	45 acres cotton, 75 acres soybeans.
High Plains, Texas	10,282	28,482	148	142	361	---	1,465	142 acres cotton.
Corn, east central Illinois	15,704	95,948	189	170	1,377	---	53	85 acres corn, 41 acres wheat, 41 41 acres soybeans.
Rice, Grand Prairie, Arkansas	11,328	29,599	161	118	662	---	2,634	41 acres rice, 76 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	7,384	13,108	43	18	1,715	2,179	42	7.3 acres tobacco.
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500								
Beef:								
Farming, western Tennessee	13,030	41,912	221	70	1,830	289	2,358	45 cows, 23 acres cotton.
Hog, west Central Illinois	20,755	90,364	209	159	2,445	---	314	24 sows (fattening 352 barrows and gilts), 31 cows (beef).
Wheat sorghum, northwest Kansas	17,852	140,808	1,538	1,076	1,421	86	---	330 acres wheat, 334 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	15,066	42,123	234	117	1,362	739	1,336	59 acres cotton, 59 acres soybeans.

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Table 16.--Resources needed for specified levels of operator earnings when land values are increased 10 percent from assumed basic prices--selected types of farms--Continued

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $3,500--Continued								
Cotton:--Con.	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
High Plains, Texas	12,616	33,655	182	174	443	---	1,798	174 acres cotton.
Corn, east central Illinois	19,082	115,010	230	207	1,594	---	64	104 acres corn, 50 acres wheat, 50 acres soybeans.
Rice, Grand Prairie, Arkansas	14,235	35,516	202	148	700	132	3,310	52 acres rice, 96 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	10,825	19,146	64	27	1,954	3,754	62	10.7 acres tobacco, 13 acres wheat.
FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $4,500								
Beef:								
Farming, western Tennessee	16,518	52,788	282	110	2,115	476	3,234	56 cows, 36 acres cotton.
Hog, west central Illinois	26,454	116,403	276	210	2,500	283	371	31 sows (fattening 448 barrows and gilts), 43 cows (beef).
Wheat sorghum, northwest Kansas	20,166	156,537	1,737	1,216	1,573	97	---	373 acres wheat, 379 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	18,580	58,045	325	163	1,293	812	1,032	61 acres cotton, 101 acres soybeans.
High Plains, Texas	14,979	38,830	215	207	525	---	2,130	207 acres cotton.
Corn, east central Illinois	23,594	142,072	284	256	1,618	---	80	128 acres corn, 62 acres wheat, 62 acres soybeans.
Rice, Grand Prairie, Arkansas	15,441	42,870	220	160	965	241	1,175	56 acres rice, 104 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	14,467	25,646	85	36	2,209	5,420	82	14.1 acres tobacco, 18 acres wheat.

Table 16.--Resources needed for specified levels of operator earnings when land values are increased 10 percent from assumed basic prices--selected types of farms--Continued

FARMS PROGRAMED FOR ANNUAL OPERATOR EARNINGS OF $5,500

Type of farm and area	Gross sales	Investment capital	Acreage		Labor required			Units of major enterprise
			Total	Cropland	Operator	Hired	Custom	
	Dollars	Dollars	Acres	Acres	Hours	Hours	Dollars	
Beef:								
Farming, western Tennessee	20,299	64,229	347	135	2,448	738	2,737	70 cows, 44 acres cotton.
Hog, west central Illinois	32,129	138,946	335	255	2,500	880	451	37 sows (fattening 544 barrows and gilts), 53 cows (beef).
Wheat sorghum, northwest Kansas	22,543	172,565	1,942	1,359	1,723	104	67	417 acres wheat, 424 acres grain sorghum.
Cotton:								
Upper Coastal Plain, South Carolina	21,227	64,564	372	186	1,425	928	1,119	70 acres cotton, 116 acres soybeans.
High Plains, Texas	17,282	44,004	249	239	607	---	2,463	239 acres cotton.
Corn, east central Illinois	26,945	160,969	325	292	1,795	---	91	146 acres corn, 71 acres wheat, 71 acres soybeans.
Rice, Grand Prairie, Arkansas	17,432	46,671	248	181	1,085	272	1,326	63 acres rice, 117 acres soybeans.
Tobacco:								
Central Coastal Plain, North Carolina	17,805	30,972	104	44	2,441	6,948	101	17.6 acres tobacco, 22 acres wheat.